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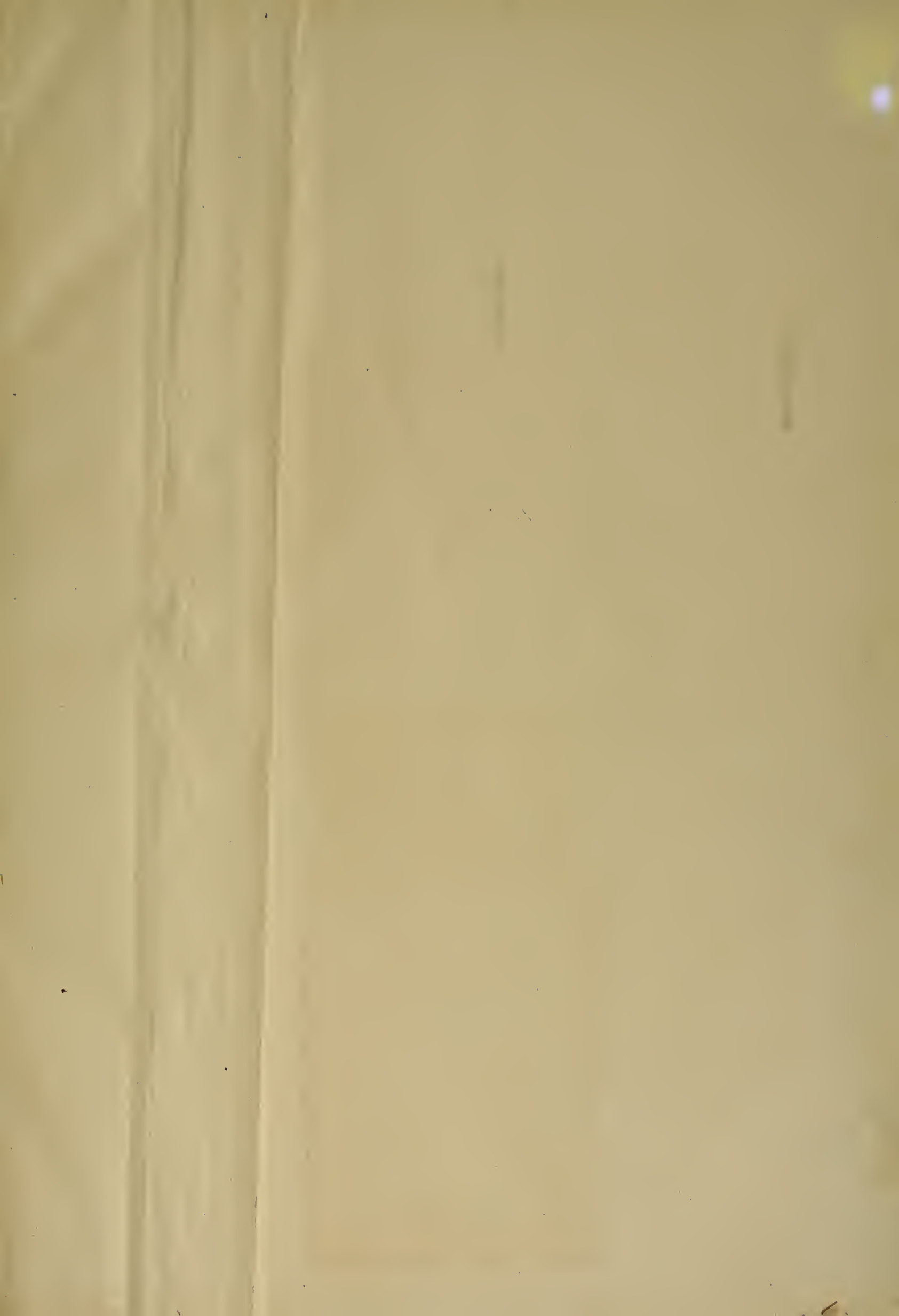
EXTRACT

From an Act prescribing Rules for the Government of the State Library,  
passed March 8th, 1861.

SECTION 11. The Librarian shall cause to be kept a register of all books issued and returned; and all books taken by the members of the Legislature, or its officers, shall be returned at the close of the session. If any person injure or fail to return any book taken from the Library, he shall forfeit and pay to the Librarian, for the benefit of the Library, three times the value thereof; and before the Controller shall issue his warrant in favor of any member or officer of the Legislature, or of this State, for his per diem, allowance, or salary, he shall be satisfied that such member or officer has returned all books taken out of the Library by him, and has settled all accounts for injuring such books or otherwise.

SEC. 15. Books may be taken from the Library by the members of the Legislature and its officers during the session of the same, and at any time by the Governor and the officers of the Executive Department of this State, who are required to keep their offices at the seat of Government, the Justices of the Supreme Court, the Attorney-General, and the Trustees of the Library.













# MINING AND SCIENTIFIC PRESS.

An Illustrated Journal of Mining, Popular Science and General News.

BY DEWEY & CO.,  
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VOLUME XXXV.  
Number 1.

## Calculating Machines.

The calculating machine shown on this page is designed to assist in all kinds of computation where multiplication and division are material parts of the work. It is a small instrument nicely made of metal, doing its work in an automatic manner and giving its results in plain figures. The portions of the work most likely to mental error are taken by the mechanism; no parts of the adding, carrying, or transposing are left to the operator, who is simply responsible for the correct setting up of the data and the correct taking off of the result. The labor usually required of the brain is here transferred to the hand. With a machine of this character time is saved on almost any description of work.

The calculating machine—though the De Colmar instrument is well known and highly valued in Europe—is almost an entire novelty in this country. But one American maker has attempted to introduce such a thing, and the few machines now in use by the larger insurance and railroad companies have been imported by their purchasers. The new machine here presented is American in invention and manufacture; and, though first produced in 1870 and patented in 1872, none were sold until 1876, and it was not perfect for general sale until 1877. Its first appearance in public was at the Centennial Exhibition, where it received a medal and diploma. The report of the judges was extremely favorable to this machine, they deeming it superior to all other instruments in its class yet produced. At a trial at the Franklin Institute it received the "Scott medal." The committee reported that "the machine works with rapidity and certainty, is composed of a comparatively small number of parts, is substantially constructed, not readily disarranged, and easily operated, effecting a saving of time of over sixty per cent. over ordinary methods, and relieving the mind from any strain, as well as removing all doubt of accuracy. It meets the requirements of practice more fully than any other machine designed for a similar purpose." The engraving will give a general idea of the appearance of the machine, and serve to illustrate the following description. Its size covers five and a half by thirteen inches on its base, and it is about seven inches high. The works are made entirely of metal, mounted on a polished wooden base board. The working parts are steel, and all striking and wearing parts are of tempered steel. The hearings are steel and brass working on cast iron. The gears and cranks are of brass, and the frame of iron. The frame, gears, slide, cylinder, crank and all parts that are to be handled, are nickel plated and polished and will not tarnish or rust. The figures on the rings, on the slide and on the wheels in the lower shaft, are stamped in the brass and filled in with black; they show clear and distinct.

All numbers to be read are shown in a prominent position, in large figures, in their proper order. All the mechanism being in full view, and easy of access, there is no cheap hidden work on the machine. There are but 150 separate pieces of mechanism, half of which are operative or working pieces, and not one of these can be called small or delicate, either in construction or action. It is not liable to get out of order by careless handling. The machine can be thoroughly understood by any one, and repaired by any ordinary machinist or clock repairer. Its action is positive, uniform, and free from sudden motions. It runs with hut little noise.

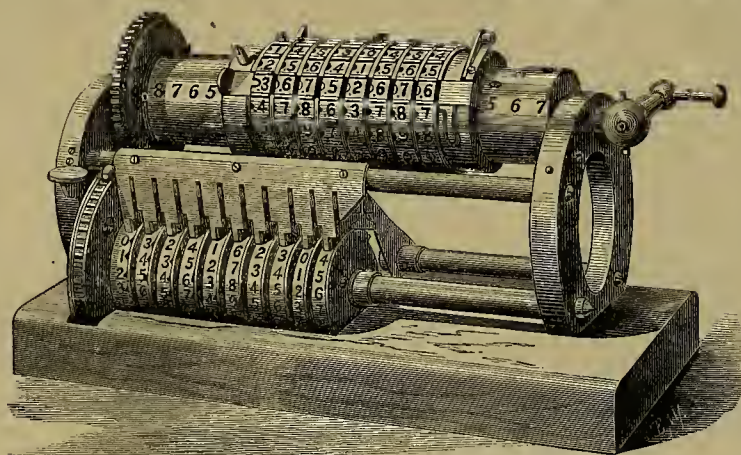
The large upper shaft, or cylinder, is hollow and empty; it is rotated by the crank, and, by means of the gear, rotates the lower shaft. On the cylinder moves a slide, which, by means of a click, can be fixed in eight equidistant positions. The slide carries eight figured rings, each of which can be quickly set by hand to read either 0 1 2 3 4 5 6 7 8 or 9. The lower shaft carries ten figured toothed wheels, each running on a hub, which is pinned to the shaft. Each wheel has a friction disk bearing against it all around, and between it and the next is a single steel lever used in carrying tens. Between the two rotating shafts is a set of ten steel claws, by means of which any number set up on the rings in the slide is added to the toothed wheels underneath at each turn of the

crank. The click at the further end, unless held down, tends to stop the machine at a fixed point. Before starting any computation, the registering wheels must all be brought to read zero, and this is done in a second by a half turn backwards of the crank.

The following is an example in multiplication: Example— $367 \times 493$ . Set up 367 on the three upper adding rings, and turn three times; shift the slide up one shift and turn nine times; shift the slide another notch, and four turns will complete the operation and show the result, 180,931, in plain figures on the recording wheels. The eight-figure machine carries eight adding rings and ten recording wheels. Any result of ten or less figures will be shown in full, but if there are more than ten places, only the upper ones will be shown.

An index to record the multiplier is a convenience and a check upon error in turning, but, as it is merely an accessory, it is applied only when specially ordered. To multiply above eight places into eight places directly, a larger machine is required; but by dividing the factors into sections, and adding the partial products, problems of any extent may be worked.

A special machine is made for the special case where formulae is worked, in which one set of factors,  $a, b, c, d$ , etc., are the same for a large number of computations. It is of the same general design as the ordinary machine, but instead of a slide carrying a single number, there is



GRANT'S CALCULATING MACHINE.

a slide capable of carrying several separate numbers. Either quantity can be quickly brought into working position, without being set up anew, and each product as found adds itself, or subtracts itself, to those already recorded, saving much time and labor, and ensuring rigid accuracy. At the same time, the compound machine is useful for ordinary work, for the compound slide takes off, and is easily replaced by an ordinary slide.

The following is an example in division: Set up the dividend, 180,931 for example, on the wheels, either by transferring from the rings, or by turning the wheels by hand. Set up the divisor, 493, by the smaller figures on the upper three rings, setting it as 492, the units place always one less. Now, it is apparent that 4.9, or, roughly, 5, will be contained in 18 about three times, and three turns of the cranks will obtain the first quotient figure three. The second and third are obtained in precisely the same way. The quotient 367 will have recorded itself automatically on the uppermost recording wheels, and the lower wheels will show the remainder, if any. An index is useless in dividing.

The machine has an advantage of three to one over common logarithms, in points of time, ease and accuracy. It is much easier and quicker to work with natural sines, tangents, etc., and natural numbers upon the machine, than to use the common logarithmic method. It is only in the case of roots and high powers that the logarithmic method is equal to the mechanical.

These machines cost from \$100 to \$200, and are manufactured only by the inventor, Geo. B. Grant, 94 Beverly street, Boston, Mass., who will furnish further information to those desiring it.

## Mining in Amador.

We are informed that they have passed through the ledge of the Doyle and Ida mines, situated in Hunt's gulch, near Jackson, Amador county. The vein appears to be about 38 feet in width, between the walls. The quartz which carries the sulphurets is about five feet in width. The rest of the ledge contains free gold. The prospects are said to be as rich as any in the State. The further they get into it the more it improves. The ground can be cheaply worked by water power, there being from 400 to 500 feet water pressure. A mill and other machinery will be erected as soon as possible.

We are told that with a small force of men they can take out nearly 100 tons of ore every 24 hours. The discovery of these two mines was made by William Doyle, an old Californian, and Capt. Beck. The management of the mines will be conducted by the latter and Capt. Weeks, both of whom are favorably known as Lake Superior miners as well as in mining districts on this coast.

There are many such mines as these in this State in which capital could be advantageously invested. Legitimate enterprises in California will be found to be more profitable than stock gambling ventures in the long run. By opening up the riches of the interior of the State

## Academy of Sciences.

The regular meeting of the California Academy of Sciences was held on Monday evening, Professor Davidson in the chair. A donation to the cabinet was received from Thomas R. Bard, of Huencme, Ventura county, California, accompanied by a letter of explanation, in the shape of specimens of fish, supposed to be trout, thrown up from an artesian well 141 feet deep, hored in the sand-hills near that place. The well, which is nearly 300 feet from high-water mark, was hored in 1871, and every year since has thrown out immense quantities of freshly-spawned fish in April and May. The first fish this year were observed in March. The well is capped, having three 2-inch apertures, from one of which people were in the habit of filling barrels with water for household uses. In that way the presence of fish was discovered in 1872. The cap was removed, and fish were ejected in incredible quantities, until the cap was replaced. In a huckelful, one-fourth of the weight of the contents was fish. It is proved that these fish have appeared every year, but it was only recently that much attention was paid to the phenomena. The pipe is badly rusted, so that one-half of the water escapes and exudes from the surface, carrying up fish, which are forced by a strong current through conduits into small lakes, where sea birds eagerly devour them. These fish are of various sizes, the largest about an inch in length. The nearest stream where fish are found is Santa Paula creek, 25 miles from the well, but it empties into the Santa Clara river, distant seven miles, at a point 20 miles distant. Fish cannot live in that stream on account of the ever shifting sands in its channel.

In regard to this fish story, Prof. Davidson said he knew Mr. Bard, and had no doubt that he had not been deceived. Something of the same kind was observed in Santa Clara county, near San Jose, where redwood sawdust was thrown from the artesian well, many miles distant from the mills in the mountains on the west side of the peninsula.

Mr. Stearns read an obituary memorial of Dr. Carpenter, corresponding member of the Academy.

Dr. Kellogg read a paper on a new genus of shrubs from the coast of Lower California, dedicated to the collector, the late Dr. J. A. Veatch, *Veatchea fruticosa*. This shrub probably has medical value, as the bark is intensely bitter.

Dr. Kellogg also read a description of a new composite shrub, *Trixia Concolor*, recently collected by Mr. Fisher, near Mazatlan, Mexico; also, a new *Enothera*, or a species of primrose, *Enothera rosaculata*, collected by Mr. J. Muir, in the Sierra Nevada mountains.

Prof. Davidson read a paper on the breakwater of Alderney, and gave his conclusions from his previous papers on harbors, as to the best, safest, most readily applied and cheapest plan for breakwaters and harbors of refuge on the Pacific coast.

The resignation of Edward F. Hall, Treasurer, was accepted.

Dr. Stout introduced Dr. L. Savatier and Mr. Leon de Cessac, from the French frigate *Magicienne*, to whom the usual courtesies were extended. It was stated that Dr. Savatier had superintended a botanical survey of Japan, and Mr. de Cessac was on a government mission to look after the natural history during the expedition.

The shaft of the Eureka claim, at Grass Valley, has been covered over and work suspended. This mine has been one of the best paying properties in California. It was opened in October, 1865, and has produced about \$4,500,000, of which \$2,094,000 has been paid to stockholders in dividends. There have been no assessments. This is the second Grass Valley mine abandoned within the past two years, the other being the North Star, once a prosperous dividend paying claim, which many believe has never been worked out.

The famous Silver Islet mine, on Lake Superior, has come to grief. Trouble between share owners and the bondholders has culminated in shutting down the mine. Besides this it is said that while the vein continues large, the percentage of silver is growing discouragingly small.



## English Lead Mines.

Amongst the oldest of our mining industries is that of lead, which in some of the British districts has been worked from remote antiquity. It has not known the marvellous growth that some mining industries have; but the mines and the districts which produce our lead have kept us well up in the race for production, although we have had to compete with Spain, with America, and other countries. For more than a score of years the mining records show that we have produced from 73,000 tons to 101,000 tons of lead ore; and although the production of ore has not been increased of late years on the average, yet the lead we have extracted has, on the whole, increased proportionately. And in other respects there has been great improvement in the condition of the lead-mining industry in those years, inasmuch that it may now be said that, instead of being produced haphazard, it is now carried on with the help of many of the more recent discoveries in metallurgical science. The facts in regard to our output of lead, and to the sources from which we derive it, may be succinctly put.

At the date of the most recent official return there were 304 lead mines in the United Kingdom; and the produce for the latest year for which the figures are attainable was 77,746 tons of lead ore, or about 57,435 tons of lead; and in addition, 487,358 oz. of silver. Confining our figures to lead ore, we find that the greatest producing district was that of Durham and Northumberland, which brought to bank 22,304 tons of ore—the bulk from the Allendale, Wear-dale, and Teesdale mines. The next contributor is Montgomeryshire, which gave 8,949 tons. Then follow, in turns, Shropshire, with an output of 7,932 tons; Cardiganshire, which yielded 5,835 tons; the Isle of Man, from whence we extract 4,429 tons; Scotland, which as a whole gives us 4,109 tons; Yorkshire, yielding 4,049 tons; Flintshire, 3,003 tons; Derbyshire, 2,600 tons; Cornwall, 2,566 tons; Derbyshire, 2,283 tons; Cumberland, 2,128 tons; Ireland, 1,850 tons; Westmoreland, 1,646 tons; Somersetshire, 1,546 tons; Carnarvonshire, 1,408 tons; and one or two districts or counties giving outputs of under 1,000 tons each, by which the total is raised to that previously given—77,746 tons. It may be noticed that the productiveness of these districts is not to be measured by the number of the mines; for Derbyshire, with 86 mines, has an output of only a tenth of that of Durham and Northumberland, in which the number of mines is only 21. In Derbyshire, 28 mines each produce less than 1 ton of ore yearly; 53 produce less than 50 tons in the year, and only 5 produce above 100 tons each; but in Durham and Northumberland, the least productive mine brings out 12 tons, and one in Wear-dale gives above 4,000 tons. It should, however, be stated that to our home production of lead we add a considerable amount imported from abroad. Deducting our exports from this, there are to be added to the produce of our own mines above 11,000 tons of lead ore, and 57,000 tons of pig and sheet lead; but our exports of lead in a manufactured state exceed our imports by about 7,000 tons. Our chief imports are from Spain and Italy; our exports are largely sent to Russia, China, and France.

Of our lead-mining districts, the chief, as previously stated, is the northern one—a tract of about 80 miles long and 20 wide, ranging from near the Roman wall down into Yorkshire. There the mines at Allendale and in Wear-dale have given for generations princely incomes to the Blackett and Beaumont families. The rich mines of Teesdale have similarly repaid the company chiefly working them, and in Swaledale great results long followed the working of the mines, one of which, at least, has been supposed to have been worked by the Romans. The mines in the slaty rock strata of Devon and Cornwall have been similarly productive; whilst the hilly ranges in Cardiganshire and Montgomeryshire are intersected by lead-bearing lodes; and in other parts of the kingdom there are inducements to the adventurer in lead mining sufficient to give ground for the belief that our productiveness as a lead-yielding nation will be long continued. The industry, it may be remarked, has not of late been so much subject to fluctuations as of yore; the price and the quantity of the output have been on the whole steadier, and as there is now an attempt to work the most important districts in a more systematic and less wasteful manner, as well as to use the local fuels, it may fairly be expected that these conditions of prosperity will be continued, and that though the demand for lead may not be largely extended, the industry will know an increase of prosperity in common with other mining adventures.

Many of the mining-districts are isolated, and at considerable distance from railway facilities; and from this cause and the nature of the employment, the communities are isolated. The fact that in most of the lead mining districts there are few if any other industries except agriculture, and that lead mining is looked to for furnish employment for the bulk of the population, and that in some of the processes of purification of the ore children have been long employed, has kept wages down, and the average for a large mining district was stated at considerably under £1 per "week." The "week," however, in this case, was one of 40 hours' work—the nature of the employment and its unhealthy character making it undesirable to

work longer at it—and some of the remaining time was often employed in gardening, in tending small grazing farms and in other modes. In the north, this mode of partial work is common in the lead mining industry, and it is also common for the work done to be paid for on the piecework system—a weekly subsidy being, however, paid to the men during the long engagements. Many of the customs in the lead mining dales are exceedingly quaint, and the isolation of some of the communities render the customs and habits of the population exceedingly primitive—the employment descending from father to son for many generations. The mode of working the mines was long a most wasteful one, and there was an indisposition to make use of the newer modes and machinery; but now, in the most productive dales, not only have improved processes been generally adopted for the purification and the smelting of the ore, but there have been successful attempts made to use the vast stores of peat fuel which are often found in the neighborhood of lead mines, and which have been applied, not only as a fuel, but to furnish light. The result is to cheapen the cost of production, and so to enable the smelter of lead to compete more favorably with other districts. For years the demand for lead for type-founding and pipe-making, as well as other purposes, has been steady, and there are indications that it will be increased. The competition with other nations is greater now than it was, but the more systematic and economical working of our mines will enable us better to meet it, as well as to produce a larger output of lead; so that looking to an increased supply of ore, a plentiful supply of labor, and an increasing adaptation of machinery, the prospects of the lead mining industry would appear to be promising.—*London Mining Journal.*

## American Locomotives in England.

Two months ago a locomotive was shipped from this country to England, and recent Hull papers comment on the fact with some wonder and some apprehension. It was a cheap engine, valued at less than \$7,000, but it is the first export thither of this kind, and is quite likely to be used as a model for British imitation. In the fiscal year 1875 our exports of locomotives to North and South America, Russia, Turkey, and Cuba were valued at about \$1,000,000. They numbered 70, and were taken by nine several countries. Since 1870 we have shipped 400, valued at \$5,500,000—the greatest numbers being 72 in 1872, and 79 in 1874, and as many the following year. The values ranged between \$341,794, and \$1,147,366, and, according to the *London Engineer*, they "are cheaper than English locomotives, do as much work, and do it as well." In addition to the propelling power, this country now exports palace cars to England and the continent; has sent street passenger cars and large quantities of car wheels, and the American passenger railway car is running on some English and several European roads. Our freight car has found the same markets; and the cars having won their way for street and railway service, the recent assertion of the *London Engineer*, that at present rates a first-class American locomotive can be placed on an English road complete for \$9,000, when the best English cannot be bought under \$12,000, would seem to show that our locomotive shops are able to equip English roads with better, and stronger, and faster engines than English works can. We are not advised whether the locomotive lately shipped is for service or as a model. The latter supposition is somewhat improbable, as the manufacture would require American mechanics, tools, appliances, and perhaps American iron; it is more likely that British engine builders are losing the patronage of their own roads, and that the import of American locomotives has commenced. Whichever is the case, the success of this model can hardly fail to be followed by new orders, since neither in mowing, reaping, sowing, nor in any other machinery have English mechanics succeeded in uniting the strength, beauty, and speed of American models. Having superiority of this nature, and greater endurance, we may rationally hope to find a market in Great Britain this year for more machinery; and winning a share of that business, we may turn to the continent and anticipate the return of more interest bearing bonds. The beginning promises well for industry and commerce.—*Philadelphia North American.*

SEPARATING NICKEL FROM ORES CONTAINING IRON.—Considerable difficulty having been met with in separating nickel from ores containing a large quantity of iron, the following method was adopted: The ore was dissolved in *aqua regia*, the silica separated; to the filtrate ammonia was added in excess, the precipitate of iron well stirred, filtered and washed with ammoniacal water; the iron redissolved with hydrochloric acid, reprecipitated with excess of ammonia, and treated as before. The two solutions were added together, and boiled to expel excess of ammonia; solution of potassa hydrate was then added and the solution heated till ammonia was no longer given off, the solution filtered, the precipitate well washed with hot water, redissolved in acid and reprecipitated by potash, washed, dried, ignited and weighed in the usual manner. Care must be taken that no copper is present during the operation. By this method better results were obtained than by the usual way.—*Chemical News.*

## New Mexico Mines.

The time is rapidly approaching when New Mexico mines will, says the *Engineering and Mining Journal*, attract no small amount of attention. All who have visited that distant Territory unite in representing its mineral wealth as great as that of any part of the West. Evidences have been found in many places of ancient mining works, showing that the people whose remains in the shape of ruined towns, acequias, fortifications, and burial mounds are so plentiful also possessed some rude ideas of mines, and probably worked many of the copper and lead deposits now known, as well as washed in the gulches for gold. New Mexico was in fact known as a mineral country long before the discovery of gold in California, and it was by Mexican half-breeds from the Cimarron range and Santa Fe that gold was found in the bed of Cherry creek, Colorado.

With the building of the Atchison, Topeka & Santa Fe railroad to Pueblo, and the extension of the Rio Grande railroad across the Raton pass towards Santa Fe, a new era has opened for the Territory. The vigor displayed in the rapid building of these lines has undoubtedly been due in a great measure to the sudden growth of the San Juan mines, which lie just north of the border of New Mexico. But already their influence has been felt even in the most remote camps of southwestern New Mexico.

The production of the mines of this Territory has been as yet very light. The gold and silver shipments have never exceeded \$500,000 annually, and until within the last five years no copper or lead was produced. The exports of base metal at present reach about \$300,000, and are increasing steadily, with the continued development of the Clifton and Santa Rita copper mines. Up to 1870 little or no silver hulled was produced, mining having been confined almost wholly to gold washing. With the opening of the Silver City district in Grant county, New Mexico entered the list of silver-producing districts, and has year by year since then increased her output of that metal, till now the exports of silver equal, if they do not exceed, that of gold.

The cause of the slow growth of the Territory is to be found mainly in the natural indolence of its inhabitants, of whom the great majority are half-breeds, content to do nothing except such as may be necessary to earn their daily bread. Up to the present time it has also been the most inaccessible portion of the Union, only approachable by hundreds of miles of staging over alkaline plains, and across burning, sandy deserts. Notwithstanding the Territory has advanced slowly in the development of its mines, and now, as railroads are approaching its borders, is showing many indications of a vigorous future. Prospectors are moving across the line from San Juan and exploring both slopes of the main range to the southward; inquiries are being made regarding the immense dry placers known to exist in the Rio Grande valley and its tributaries, and in the already opened mining districts a renewed activity is reported as a consequence of the prospect of railroad communications with the rest of the world.

The principal mining districts of New Mexico are the Moreno (quartz-placer) in the Cimarron range, the Pinos Altos in the southwestern corner of the Territory (gold quartz), and the Old and New Placer Mountains. Of these the first two are at present the most developed. The second includes the Santa Rita and Clifton copper mines and the lively camps of Silver City and Georgetown.

The Moreno mines have been at times developed with great vigor and energy, and have yielded excellent returns. The ores found are pyritous, decomposed at the surface, and of the class known as refractory, that is, not capable of being saved except by smelting. On that account as soon as the free surface quartz was exhausted the district languished, and cannot be expected to revive permanently until supplied with proper reduction works. Meanwhile, the placer grounds of the Cimarron and Moreno rivers are being worked with success; and will in the near future attract enough attention to draw capital to the camp, which in every way is worthy of careful examination.

Pinos Altos district, embracing the silver mines of Silver City and Georgetown, the copper mines of Clifton and Santa Rita, and the gold veins of Pinos Altos, is at present the most prosperous district in New Mexico. The silver mines are in limestone, and have yielded handsomely. The copper mines are among the finest to be found anywhere, and are producing steadily. The gold lodes as yet are under a cloud. At the surface they yielded their treasure freely as usual, but as soon as the zone of decomposition was passed and pyrites were reached the camp received a check, owing to the remoteness of its position and the large capital required for the beneficiation of its ores, from which it has not yet recovered.

The placer grounds lying at various points in the valley of the Rio Grande, and in the ranges bordering it on either side, are among the most extensive in the West. Millions of acres of upland slopes are known to be auriferous to a high degree, and before the Territory came into the possession of the United States these and the gulches adjacent were worked in rude ways by Mexicans and made to pay. The great disadvantage of the locality is the lack of water, but this trouble, surveys have shown, can be overcome.

With a railroad once across its northern line

and into the valley of Rio Grande, a new life will come to this much neglected Territory. With mines as rich as those to be found anywhere, and hundreds of miles of deep placers scarcely touched, it presents a most inviting field for exploration and unusual attractions for careful investment. It is to be hoped that the new southern road, the Atchison, Topeka & Santa Fe, will before long push its main line still farther southward, and open it to the world.

## Distilled Water for Marine Boilers.

A London mechanical engineer has been studying the action of marine boilers, and decided that they should be fed nothing but fresh or distilled water. This water he proposes to care for so carefully that it may be used over and over again, without any admixture of sea water or the products of sea water; and this was easily accomplished, as the machinery in question had been designed to avoid any leak whatever, and the amount of waste that did take place from glands, etc., was so small in quantity, that no practical inconvenience was found in providing the small supply of fresh water required to make good the waste that did occur.

The possibility of using water which did not injure the internal surface of the boiler enabled the author to design the boiler on a system that combines maximum strength and safety. The horizontal tubes of the boiler are 2½ inches internal, and 3 inches external diameter, excepting the steam-collecting tube, which is 4 inches internal and 5½ inches external diameter. The horizontal tubes are welded up at each end one-half inch thick, and connected by small vertical tubes of seven-eighths of an inch internal and 1 5-16ths inches in external diameter. The firebox is formed of tubes bent into a rectangular shape placed 1½ inches apart, and connected by numerous small vertical tubes seven-eighths of an inch internal diameter. The body of the boiler is made of a number of vertical sections, composed each of 11 tubes, connected at each end by a vertical one; these sections are connected at both ends by a vertical tube to the top ring of the firebox, and by another to the steam-collecting tube. The whole of the boiler is surrounded by a double casing of thin sheet iron, filled up with vegetable black to avoid loss of heat.

The engine has three cylinders—the first is a single-acting, high-pressure cylinder, and the second also a single-acting cylinder, four times the capacity of the first; these two cylinders are bolted together in the same straight line, and have a common piston rod. The third cylinder is double-acting, four times the capacity of the second, and its piston rod is connected to a crank at right angles to the other crank.

Having safely generated steam of high pressure at—say 350 pounds per square inch—a serious difficulty has to be overcome in using it, from the temperature affecting the lubrication of the pistons and packing of the glands. This difficulty the author has succeeded in overcoming by introducing the high-pressure steam into the upper end of the first cylinder, where there is no gland, and where the piston is formed so as to require no lubricating material. The steam is cut off at about half stroke in this cylinder, and when it is admitted for the return stroke into the bottom of the second cylinder, of four times the area, the temperature is so much reduced as to cause no difficulty when brought into contact with the piston rod gland. From the bottom of the second cylinder the steam expands into the top of the same cylinder, which is of larger capacity than the bottom, and serves as a chamber, and is in direct communication with the valve-box of the third cylinder; this last is double-acting, and is arranged to cut off at about a quarter stroke, and at the termination of the stroke exhausts into the condenser, with a total expansion of about thirty-two times. All the cylinders are jacketed with wrought-iron tubes, which are cast in the metal, and supplied with steam direct from the boiler, the condensed water from the jackets being conveyed to the bot-well. The whole of the valve-boxes, etc., are inclosed with a double case of thin sheet iron, filled in with vegetable black, to maintain all the parts at a high temperature.

The surface condenser used is constructed of a number of vertical tubes in such a manner as to be absolutely tight, so as to insure that the condensing water inside the tubes shall not mix with the water from the condensed steam outside them. The tubes are seven-eighths of an inch internal and one and five-sixteenths inches external diameter, welded up at the top end and fixed securely in a tube plate at the bottom. These tubes are fitted with internal tubes, open at both ends, which are fixed in a division plate at the bottom, in order to cause the condensing water to circulate to their extreme ends, the course of the circulating water being shown on the drawing by arrows.

A small still, worked by a steam coil, is used to distill water for replenishing any small waste that may take place in the feed supply. A duplicate apparatus forms part of the ordinary equipment of a sea-going vessel, to furnish steam from sea water for blowing the steam-whistle, cooking, supplying distilled water for use of passengers and crew, and other purposes where distilled water is required.

A stock dividend of one and one-half shares of the Governor Consolidated mining company's stock for each and every share of the Martin White company's stock has been declared by the Directors of the Martin White mining company, payable on and after June 22d, 1877.



## MECHANICAL PROGRESS.

## The Iron Industry in 1876.

Mr. James M. Swank, Secretary of the American Iron and Steel Association, has just issued his annual statistical report of the progress of the iron industry in the United States during the year 1876. The production of pig iron in the United States in 1876 was 2,093,236 tons, against 2,266,581 tons in 1875, 2,689,413 tons in 1874, 2,868,378 tons in 1873, and 2,854,558 tons in 1872. The decrease in 1876, as compared with 1875, was 173,345 tons, or about 8%. Since 1873, the greatest year of production, each year has shown a decrease as compared with the preceding year, the percentage of decrease being as follows: 1874, 6.4; 1875, 15; 1876, 8%. From 1873 to 1876 the decrease has been 775,042 tons, or 27%. This is a very great shrinkage, and indicates, with concurrent low prices, a very great depression in the pig iron industry of the country. Mr. Swank says: If the rate of decrease which marked the period from 1873 to 1876 were to be continued, the production of pig iron in the United States would entirely cease in 1884, less than eight years from the present time, and our furnace stacks would only be useful as observatories for the study of astronomy. But our pig iron industry is not destined to come to such an untimely end, for we see that the heavy percentage of decrease which had characterized the year 1875 was not continued in 1876—the decrease in the former year being 15%, and in the latter year only 8%. It seems plain, from a consideration of the relative decrease in these two years, that the mere production of pig iron commenced last year to rally from the effects of the panic of 1873, and this view is strengthened by reference to the statistics of the stocks of pig iron on hand and unsold at the close of the last three years, which will be found elsewhere in this report. At the close of 1874 these stocks amounted to 795,784 net tons; at the close of 1875 to 760,908 tons; at the close of 1876 to 674,798 tons. A decrease in stocks at the close of last year, and the arrest in 1876 of the headlong decline in production which characterized 1875, are certainly strong symptoms of an early increase in the manufacture of American pig iron. We believe that we stand even now within the shadow of this increase. From information in our possession, and from a careful survey of the whole field embraced by the iron and allied industries of the country, we feel entirely safe in predicting that the production of pig iron in 1877 will be at least as great as it was in 1876. It is for the producers to decide whether it is wise to increase production at present prices.

Twenty-three States and the Territory of Utah made pig iron in 1876. Pennsylvania made almost half of the total product, namely, 1,009,613 net tons, or 48.2%, slightly increasing its production over that of 1875, and largely increasing its percentage, which was 42.4 in that year.

## A New Electric Motor.

A Bostonian, Prof. Gary, claims to have discovered a new method of applying electric force to motive power, and gives the rationale of his arrangement. Believers in "perpetual motion" will be interested in reading the following: It is well known, not only to the scientific, but to all who have observed the ordinary phenomena of magnetism, that when a bar of soft iron is made to approach the poles of a permanent magnet it becomes magnetized, and while in that position is itself a magnet by induction, having polarity and the power of attraction and repulsion like other magnets, opposite poles attracting and like poles repelling each other. But Prof. Gary has discovered what is not generally known, that as the bar of iron is brought nearer the poles of the magnet, when very near, yet not quite in contact, its polarity changes, the positive pole becoming negative and the negative pole positive. The discovery of this law is the point on which the invention turns. By encircling the bar with a very slight current of electricity to produce an equilibrium between the magnet power of the bar and that of the permanent magnet, the polarity of this current being changed, by means of a current changer, to correspond with the change of polarity in the bar, at the instant such change takes place attraction ceases and repulsion begins, and a reverse motion is obtained.

Then by using two magnets, or sets of magnets, one to attract while the other repels, the bar of iron, which may be attached to a walking beam, pendulum, or other lever, is moved to and fro with a rapidity and regularity suited to any mechanical use, and with a power limited only by the power of the magnets applied.

In using the ordinary electro-magnetic power the current of electricity must be equal to the power of the magnet which it operates, but in this case, as compared with the available power of the permanent magnet, the power of the electric current may be less than one to 100, and it may be taken from a small galvanic cup, or it may be generated by friction of the machinery as it runs, so that the cost of producing it is next to nothing.

The engines which Prof. Gary has already constructed upon this principle are of the size for running dental machines, sewing machines, jig saws and other small machines requiring little power, but he sees no reason why they

using larger magnets, and more of them, the available power may not be increased indefinitely.

**NICKEL PLATING.**—A foreign exchange gives the following recipe: To a solution of five to 10 per cent. of chloride of zinc, as pure as possible, add sufficient sulphate of nickel to produce a strong green color, and bring to boiling in a porcelain vessel. The piece to be plated, which must be perfectly bright and free from grease, is introduced so that it touches the vessel as little as possible. Ebullition is continued from 30 to 60 minutes, water being added from time to time to replace that evaporated. During ebullition nickel is precipitated in the form of a white and brilliant coating. The boiling can be continued for hours without sensibly increasing the thickness of this coating. As soon as the object appears to be plated it is washed in water containing a little chalk in suspension, and then carefully dried. This coating may be scoured with chalk, and is very adherent. The chloride of zinc and also the sulphate of nickel used must be free from metals precipitable by iron. If during the precipitation the liquor becomes colorless, sulphate of nickel should be added. The spent liquor may be used again by exposing to the air until the contained iron is precipitated, filtering and adding the zinc and nickel salts above. Cobalt also may be deposited in the same manner.

**A NEW STEAM CRANE.**—English exchanges give accounts of a trial of a self-acting bucket and fork, with patent double-barreled crane or winch, which has just been brought out by a Hull firm. The crane is an excellent specimen of mechanical skill. It travels on rails, and the peculiarity in its construction is that it has very simple frictional gear, with two barrels and levers so arranged that one man has complete control over the bucket, either whilst hoisting or lowering, and at the same time is able to swing it round to any given place in discharging its contents. The bucket is attached to the crane by two chains, on one of which it is lowered by means of a brake. It falls wide open into the material which requires lifting, and by hoisting the second chain it is drawn down by a very simple arrangement of levers, and whilst filling, gradually closed. The bucket is then raised to any height, and by throwing the weight again on the first chain, is made to open again and discharge its contents. By this ingenious piece of mechanism a great saving is effected in time and labor. The self-acting bucket is available for lifting seed, grain, sand and gravel, mortar, coals, etc., and is especially useful in dealing with sewage and dredging small lakes and ponds.

**INCLINED PLANE RAILWAY.**—The *Iron Age* says that the Duquesne inclined plane, opposite the New Point bridge, at Pittsburgh, was opened to the public on the 17th ult., and on the 20th there were 7,000 passengers passed over it. The elevation of this plane is 400 feet, the whole length being 792 feet; the grade is 30½ degrees. The engines at the top of the hill are each 75-horse power; each car weighs 4½ tons, and is made 7 feet wide by 15 feet in length, with seats for 40 passengers, the trucks being made of rolled beams. The freight compartment of each car measures 6x6x7 feet, and is built beneath the floor of the passengers' room or compartment. The drum and wheel are each 12 feet in diameter, the drum being entirely of cast iron. The boilers (two) are each 42 inches by 24 feet. The bridge is all wrought iron, 362 feet in length, and was built by the American Bridge Company, of Chicago. The highest iron trestle is 71 feet between the masonry and the bottom chord of girders.

**MAKING MARBLE FROM SLATE.**—A new industry that is steadily growing into importance, is the turning of slabs of slate into imitation marble. The process is thus described: The slabs of slate are first surfaced by a planer, and brought to the required thickness, and patters are then laid upon the slabs, and mallet and chisel work out the desired forms and moldings. The peculiar feature in the operation, however, is the marbleizing. The material for the latter is prepared in a vat, and the slab is let down upon the composition, which adheres to the surface of the slate; the slab is next baked in an oven for one night, then coated with a varnish manufactured for this special purpose, and after six repetitions of these processes, it is finally removed and polished, the surface presenting, as is well known, a beautiful appearance; and so firmly united to the slate is this coating that it cannot be scaled or chipped off without taking the slaty particles with it.

**COTTON SEED AS BOILER FELTING.**—A Florida paper mentions a new use to which cotton seed has recently being put that is of no little import. It is in the shape of a non-conducting cover for steam boilers, and is described thus: "It is the cortical part of the seed with the little fuzz attached that is used. A layer of these cotton seed hulls is put around the boiler with the aid of slats, and then the whole is covered with a layer of plastering. With 25 pounds of steam on the surface of this casing it was barely warm; and we are assured that both in the engine and fire-rooms the temperature has been greatly reduced, so as to be much less oppressive, since the casing was put on. This seems to be something entirely new, and though in the present instance it is highly satisfactory, the party who tried it thinks he can suggest some improvement so as to render the non-conducting of heat still more perfect.

## SCIENTIFIC PROGRESS.

## Spontaneous Generation.

A few weeks ago we gave Dr. W. H. Dallinger's notes of researches into the monads and other minute organisms. Readers who have followed Tyndall through his examination of the germ theory, will be pleased to learn the results of his recent experiments. In a recent lecture in London he gave a resume of the work done in the spring of 1875-6, which went conclusively to show that in the atmospheric conditions then existing in the laboratory of the Royal Institution, five minutes' boiling was found to be sufficient to sterilize the infusions in any of the many hundred flasks and tubes experimented on, both animal and vegetable infusions being used. In the autumn of 1870 Professor Tyndall resumed his experiments with hay infusions, but found that some, instead of needing only five minutes to sterilize them, required 15 minutes. The way in which he found that not only did the hay behave differently than in the previous experiments, but that also all the tubes of other infusions experimented on in the Royal Institution showed decomposition, and how he traced all this to dry old hay in the laboratory, he described to members of the Royal Institution in January last. Led thus to examine the old hay, he has found that in some cases the bulbs charged with infusions of it were not sterilized with even four hours' continuous boiling, and in some cases germs were found so indurated that four or six, and in one case even eight hours, were not sufficient to deprive them of life. It is a question of obvious interest to the scientific surgeon whether those powerfully resistant germs are amenable to the ordinary processes of disinfection. They have been found competent to cause infusions, both animal and vegetable, to putrefy. How would they behave in the wards of an hospital? And again, how do they act in establishments for preserving meats and vegetables in tins? The shaking of a bunch of desiccated hay might make the processes of boiling quite nugatory. Professor Tyndall's later researches have made known to him that discontinuous heating for a short time will produce the death of the germs. An aggregate of four minutes in the one case will effect what four continuous hours in the other could not. A temperature, too, far below the boiling point suffices. The fully developed bacterium is killed at 140° Fab. Fixing the mind's eye upon the germ during its passage from the hard and resistant to the plastic and sensitive stage, it will appear in the highest degree probable that the plastic stage will be reached by different germs in different times. Some are more indurated than others, and require a longer immersion to soften and germinate. For all known germs there exists a period of incubation, during which they prepare themselves for immersion as the finished organisms, which have proved themselves so sensitive to heat. If during this period and well within it the infusion be boiled for even a fraction of a minute, the softened germs which are then approaching their phase of final development will be destroyed. By repeating this process every 10 or 12 hours, and before the least sensible change has occurred in the infusions, each successive heating will destroy the germs then softened and ready for destruction, until after a sufficient number of heatings the last living germ will disappear. Another means of destruction has been found to be to deprive the infusions of air. Unboiled infusions deprived of air by five or six hours' action of the Sprengel pump are reduced to permanent barrenness. Like higher organisms, the bacterial germs are poisoned by the excess and asphyxiated by the defect of oxygen.

**DEEP SEA LIFE.**—The mystery of deep sea life lies in the fact that there are multitudes of representatives of the animal world which, in virtue of their animality, are incapable of nourishing themselves upon inorganic matter, yet which are living miles below the limit at which vegetable life ceases. Some of the organisms found in deep sea soundings are undoubtedly of a vegetable nature; but these are surface-living diatoms, or other forms, which sink when they die. This animal life at the sea bottom is capable of appropriating as food the organic matter held dissolved in the ocean water, as well as the inorganic substances necessary for the formation of its skeleton and the gases required for respiration. For life at the bottom of the sea is essentially like all other animal life; it requires food to eat, air to breathe, and minerals from which to elaborate its framework. Careful experiment has solved the difficulty: the surface-living nutriment descends after death; slowly and laboriously the life-sustaining oxygen makes its way from the surface to the depths where cold and darkness reign, and as slowly the poisonous carbonic acid—the result alike of life and death—makes its way to the surface. Thus, just such life as can exist under the difficult conditions there present, does exist in enormous extent.—*Scribner.*

**A DISCOVERY.**—Principal Dawson announces the discovery of the diploxylon of Corda in the coal-measures of Nova Scotia. It is related to the sigillaria, with features approaching those of the lepidodendron, and has never before been seen in this country.

## Wonders Under Water.

M. Tosselli states that he has been making experiments with his submarine vessel, or "marine mole," as he calls it. He is struck with the correspondence of many of the phenomena to those observed in ballooning, and considers that it is at the bottom of the sea that the problem of aerial navigation will be solved. In a liquid mass which is still, the machine moves quite well in obedience to the screw propeller, which is driven by the hand. But if the vessel meets a current, it is vain to think of contending with it. Another difficulty, as in balloons, is in orientation. Once a balloon has got to some distance from the earth, it becomes impossible to tell the direction in which it is going. The needle is useless. And, similarly in the "marine mole," when it is only 0.39 of an inch under the surface, and nothing is seen in motion but the fish, the compass is found of no use. To go to a certain point, an artificial meridian has to be arranged outside. M. Tosselli remarks, too, on the great distinctness with which sounds are heard. At a depth of 110 feet the screw of a steamer, passing about 660 yards off, sounded in the (hermetically closed) mole as if directly overhead. The contrivance of M. Tosselli, affording as it does a novel opportunity of observation, may furnish some instructive data in physics.

**OBTAINING LIGHT BY BURNING QUARTZ.**—According to the *Telegraphic Journal* M. Plante has called attention in the French Academy to the bright light obtained when an electrode of one of his secondary batteries (a powerful one) is applied to a glass tube or wall of a glass vessel containing a saline solution. With the positive pole a stronger force is required; but the light is more silent than with the negative, which produces some crackling. When the light appears an abundant white vapor is given off, having a slight alkaline reaction. The glass is strongly attacked and devitrified. It might be thought that the brightness was due to lime combined in the silicon; but in the spectrum there are no appreciable lines, except some traces of that of sodium; whereas a piece of lime spar, under the same conditions, gives distinctly the lines of calcium along with a continuous spectrum. The lines of silicon do not appear, being weak, and the spectrum being intensely luminous, just as the carbon lines are not perceptible in the spectrum from the voltaic arc. The silicic origin of the light is further proved by the fact that it is obtained likewise on contact of the electrode with pure silicon in the state of crystals of hyaline quartz. M. Plante proposes to distinguish this kind of light as the *electro-silicic light*.

**GEOLOGICAL.**—An interesting point of structural geology, elaborated by Wing (according to Prof. Dana, in *American Journal of Science*), relates to the overlapping of newer by old formations near Lake Champlain. Grandview (Snake) mountain consists of Potsdam sandstone, resting upon the western edge of an inverted syncline, consisting of the Chazy, Trenton and Lorraine shales. The sandstone covers the other beds unevenly, the western edge resting first, at the north end, upon the shales, then upon the Trenton, the Chazy, and lastly, in the southeast part of Bridport, lying upon and falling from the calciferous sand rock. This overlap and fault is part of a very extensive dislocation, said by the late Sir W. E. Logan to extend from Quebec to Alabama. The order of the rocks adjacent is not commonly the same with that studied by Wing.

**NEW SPECTROSCOPE.**—Mr. Christie has recently devised a new form of spectroscope, which, if the accounts given of it are to be depended upon, is really wonderful in its performance. The prisms employed are compound prisms of dense flint glass, combined with crown, put together in something the same way as the glass and bisulphide of carbon in the well-known Eaton direct-vision prism. It is said that an instrument of the new form, with two of the so-called "half-prisms," gives a diversive power equal to that of 20 ordinary prisms, while the loss of light is vastly less. The theory of the instrument has been a good deal discussed, and some doubts are expressed as to its defining power, which can only be settled by a record of actual performance.

**TOUGHENED GLASS IN THE GERMAN ARMY.**—The German army is to have the benefit of the newest thing out in the way of glass. Their old water bottles have been confiscated, and a new pattern has been expressly constructed in glass toughened by the De la Bastie process. The new flasks may be flung on the ground and do not break, are not damaged by the ordinary casualties of concussion, and do not crack if filled with hot fluids. The stoppers (stated to have been invented for the purpose by the manufacturer, Pritzner, of Berlin,) are those known as pneumatic stoppers, a lever pressing a disc of india rubber into contact with the sides of the neck. The flask is opened or closed by pressure on the lever on being raised or lowered.

**TENIA.**—Dr. Leidy, of Philadelphia, at a recent meeting of the Academy of Science, exhibited a specimen of tape-worm said to have been taken from the inside of a large cucumber. This was the first time he had heard of one of these worms having been found in a vegetable. The specimen has all the characteristics of a tape-worm, but belongs apparently to an unknown species.



Table of Highest and Lowest Sales in S. F. Stock Exchange.

Name of Company.	Week Ending June 11	Week Ending June 18	Week Ending June 25	Week Ending July 2
Alpha.....	151	93	101	131
Alta.....	1	750	2	1,205
Andes.....	50c	30c	11	50c
Baltimore Con.....	75c	55c	11	70c
Belmont.....	5	95	41	5
Best & Belcher.....	131	163	331	171
Bullion.....	3	430	121	41
California.....	3	70	2	1,100
Challenge.....	1	750	21	1
Chollar-Potosi.....	33	26	49	251
Confidence.....	1	45c	2,35	70c
Con Imperial.....	341	30	361	311
Crown Point.....	6	3,60	64	4
Coso Con.....	60c	50c	11	60c
Dayton.....	163	151	201	171
Eureka Con.....	5	3,35	71	31
Excelsior.....	5	3,35	71	31
Geddes & Bertrand.....	101	51	101	121
Gen Thomas.....	51	61	101	81
Golden Charlotte.....	2,65	1,35	1,90	11
Gould & Curry.....	7	201	81	161
Hale & Norcross.....	5	3,15	10	4,60
Hussey.....	25	15	35c	20c
Julia.....	2,60	11	5	2,25
Justice.....	7	4	11	61
Kentucky.....	24	24	31	41
K K Con.....	3	3	3	3
Kentucky.....	51	31	6	4
Knickerbocker.....	75c	55c	11	70c
Leads.....	31	24	1,15	80c
Leviathan.....	1,75	1,40	11	1,65
Modoc.....	24	2,60	1,90	2,45
Manhattan.....	71	7	81	71
Manfield.....	25	10c	75c	15c
Meadow Valley.....	9	7	161	9
Mexican.....	9	7	161	9
North Con Virginia.....	40c	30c	90c	30c
New York.....	20c	10c	75c	25c
Northern Belle.....	101	161	161	161
New Coso.....	3	2	2,1	1,40
Occidental.....	17	121	21	1
Ohir.....	191	14	29	111
Pacific.....	51	40c	25c	11
Phil Sheridan.....	40c	25c	1	50c
Panther.....	55c	35c	75c	40c
Prospect.....	55c	35c	75c	40c
Raymond & Ely.....	6	51	10	7
Rock Island.....	55c	25c	25c	15c
Savage.....	21	4,55	111	51
Best & Belcher.....	21	4,55	111	51
Sierra Nevada.....	51	4,20	9	4,60
Silver Hill.....	1,90	11	41	2,05
South Charlotte.....	50c	30c	1,50	85c
Trojan.....	1,15	80c	1,50	85c
Union Con.....	61	4,35	8	61
Utah.....	201	16	201	131
Vallejo.....	201	16	201	131
Woodville.....	71	51	131	111
Yellow Jacket.....	71	51	131	111

Sales at S. F. Stock Exchange.

FRIDAY, A. M., JUNE 29.	530 Modoc.....	2,62,05
70 Alpha.....	111	165 Mexican.....
225 Alta.....	141	375 Northern Belle.....
1000 Andes.....	141	675 New Coso.....
5 Baltimore Con.....	50c	155 Ohir.....
75 Best & Belcher.....	21	40 Panther.....
120 Belcher.....	55	455 Raymond & Ely.....
150 Bullion.....	300	80 Rye Patch.....
250 Con Imperial.....	1,150	260 Savage.....
535 Crown Point.....	4,05	60 Silver Hill.....
135 California.....	331	470 Sierra Nevada.....
446 Con Virginia.....	34c	300 Stepoc.....
115 Chollar.....	30	30 Utah.....
545 Chollar.....	30	40 Yellow Jacket.....
850 Dayton.....	45	
375 Excelsior.....	55	
1250 Gould & Curry.....	131	
355 Hale & Norcross.....	51	
200 Julia.....	270	
525 Justice.....	70	
150 Joe Seates.....	60	
125 Knickerbocker.....	115	
100 Lady Wash.....	1	
50 Leviathan.....	45c	
1350 Lady Bryan.....	65c	
100 Leavenworth.....	1,150	
125 Morning Star.....	10	
200 New Con Vir.....	25c	
50 Ohir.....	30c	
170 Overman.....	14	
850 Prospect.....	30c	
165 Peytona.....	11	
100 Rock Island.....	20c	
255 Savage.....	50	
455 Sierra Nevada.....	50	
10 Sep Belcher.....	20	
120 Silver Hill.....	2	
550 Trojan.....	250	
450 Union Con.....	770	
120 Utah.....	131	
280 Woodville.....	30c	
150 Yellow Jacket.....	121	
20 Alps.....	50	
600 Argenta.....	1,75	
450 Belmont.....	75	
240 Bullion.....	225	
45 Con Virginia.....	331	
230 California.....	34	
191 Con Imperial.....	1,10	
200 Crown Point.....	1,10	
400 Empire Id.....	31	
55 Eureka Con.....	181	
245 Excelsior.....	55	
550 Golden Char.....	11	
200 Gila.....	25c	
40 Hale & Norcross.....	6	
225 Hussey.....	20c	
100 Jackson.....	20	
95 Julia.....	21	
40 Justice.....	71	
980 Leavitt.....	131	
200 Manhattan.....	71	

SALES OF LAST WEEK AND THIS COMPARED

THURSDAY, A. M., JUNE 28.	345 Alpha.....	121
25 Andes.....	80c	
100 Alta.....	11	
115 Best & Belcher.....	11	
115 Belcher.....	51	
840 Bullion.....	61	
50 Baltimore Con.....	50c	
500 California.....	35	
100 Confidence.....	1	
100 Challenge.....	1	
210 California.....	3,40	
160 Chollar.....	31	
220 Crown Point.....	4,10	
1700 Con Imperial.....	201	
490 Con Virginia.....	33	
470 Dayton.....	50	
370 Excelsior.....	55	
1635 Gould & Curry.....	131	
355 Hale & Norcross.....	51	
355 Justice.....	71	
695 Julia.....	2,80	
100 Joe Seates.....	60	
305 Kentucky.....	50	
50 Kosuth.....	25c	
650 Leviathan.....	50	

900 Lady Bryan.....	65c
115 Mexican.....	101
100 North Con Vir.....	30c
200 New York.....	35c
180 Overman.....	141
265 Ohir.....	151
150 Prospect.....	25c
450 Peytona.....	161
150 Rock Island.....	15c
1310 Savage.....	55
220 Sierra Nevada.....	4,60
255 Silver Hill.....	201
300 Trojan.....	1,85c
180 Utah.....	131
465 Union Con.....	51
90 Yellow Jacket.....	11

## Pacific Board—Latest Sales.

THURSDAY, A. M., JULY 5.	500 Coso Con.....	12c
40 Alpha.....	111	
240 Best & Belcher.....	20	
100 Belmont.....	20	
190 California.....	2,62	
40 Chollar.....	33	
175 Con Imperial.....	1,07	
350 Dayton.....	3,80	
170 Excelsior.....	51	
255 Gould & Curry.....	131	
200 Hale & Norcross.....	51	
670 Julia.....	20	
230 Justice.....	51	
1250 Mexico.....	1,01	
140 Ohir.....	30	
70 Overman.....	131	
200 Rock Island.....	25c	
250 Savage.....	61	
120 Sierra Nevada.....	4,45	
300 Trojan.....	80c	

## California Board—Latest Sales.

THURSDAY, A. M., JULY 5.	50 Alpha.....	12
100 Baltimore Con.....	70c	
70 Best & Belcher.....	21	
50 California.....	34	
50 California.....	1,05	
310 Con Imperial.....	1,10	
70 Con Virginia.....	34	
50 Crown Point.....	4	
40 Excelsior.....	51	
200 Alta.....	200	
70 Knickerbocker.....	30c	
140 Lady Wash.....	1,05	
10 McClellan.....	10c	
25 Meadow Valley.....	20c	
300 North Carson.....	15c	
700 Ohir.....	17	
40 Overman.....	131	
120 Rock Island.....	25c	
175 Silver Hill.....	31	
25 Stepoc.....	31	
400 Trenton.....	41	
500 Trojan.....	25c	
200 Utah.....	131	

NEW MINING ENTERPRISE.—A new mining enterprise of considerable magnitude and importance, says the *Calaveras Chronicle*, has recently been instituted in this vicinity and is being energetically prosecuted. Mr. C. J. Garland, a gentleman largely connected with the mining interests of the county, has purchased the old Kitzridge & Carpenter gravel mine in Chile gulch, and is erecting a 10-stamp battery for the purpose of crushing the dirt. The gravel is a kind of cement, agglutinating so closely that it cannot be washed by the ordinary process. The claim was extensively worked in former years and paid richly. It is thought that with the aid of a battery the cement, which could not be washed without crushing, can be made to pay, and Mr. Garland has engaged in the enterprise with the determination of seeing it through to success. Work upon the mill has already been commenced, the erection of the machinery being under the supervision of Mr. John Rider, an experienced and skillful millwright. The battery is to be run by water power, the ditch passing along close to the ground and enough above it to admit of obtaining a pressure of 260 feet. The mill will be in readiness as soon as a large force of hands can complete it, and we have every reason for believing that Mr. Garland's energy and enterprise will be well rewarded when active operations are commenced. He deserves success, and it won't be his fault if he doesn't win it.

The Oregon Steamship Co. has agreed to carry on its iron steamship, now being built at Chester, Pa., by John Roach & Son, upon her completion, on or about the 15th day of January, 1878, steamer passengers from New York to Portland direct, via the Straits of Magellan, at the extremely low rate of \$75, currency, board included.

## MINING SHAREHOLDERS' DIRECTORY.

(Compiled every Thursday from Advertisements in the Mining and Scientific Press and other S. F. Journals.)

## ASSESSMENTS—STOCKS ON THE LISTS OF THE BOARDS.

COMPANY.	LOCATION.	NO.	AMT.	LEVIED.	DELINQ'T.	SALE.	SECRETARY.	PLACE OF BUSINESS.
American Flat M Co	Washoe	7	25	May 18	July 11	July 31	C A Sankey	331 Montgomery st
Alta S M Co	Washoe	7	50	June 7	July 12	Aug 2	W H Watson	302 Montgomery st
American Flag M & M Co	Pioche	10	25	June 23	July 31	Aug 2	G B Stacey	419 California st
Bullion M Co	Washoe	4	150	June 25	July 13	Aug 20	J S Kennedy	419 California st
Caldonia S M Co	Washoe	20	50	June 6	July 13	July 31	R Wegener	414 California st
Crown Point M Co	Washoe	31	100	June 19	July 24	Aug 14	J Nevadans	419 California st
Con Imperial M Co	Washoe	4	20	May 19	June 21	July 12	W D Dean	419 California st
Godfrey Gravel M Co	Cal	1	5	June 22	July 25	Aug 13	J M Buffington	309 California st
Justice M Co	Washoe	20	150	June 7	July 12	Aug 1	J S Kennedy	419 California st
Knickerbocker M Co	Cal	1	30	May 16	June 21	July 12	J H Sayre	330 Pine st
Meadow Valley M Co	Ely District	14	75	June 6	July 20	Aug 13	T W Colburn	408 California st
Mexican & S M Co	Cal	1	30	June 5	July 10	July 30	C L McCoy	419 California st
Martin White M Co	Cal	1	200	May 28	July 7	Aug 6	J J Scoville	309 Montgomery st
New York M Co	Washoe	12	15	June 14	July 19	Aug 4	D L Thomas	419 California st
New Coso M Co	Cal	1	20	May 22	July 25	Aug 23	D F Verdenal	409 California st
Pacific Con M Co	Washoe	33	300	June 20	July 5	Aug 13	J D Edwards	414 California st
Savage M Co	Cherry Creek	2	50	June 15	July 16	Aug 13	J L Fields	334 Pine st
Succor M & M Co	Washoe	28	100	May 29	June 29	July 18	E B Holmes	309 Montgomery st
Sierra Nevada S M Co	Washoe	17	50	May 28	July 2	July 23	W H Watson	302 Montgomery st
	Washoe	49	50	June 13	July 17	Aug 6	W W Stetson	309 Montgomery st

## OTHER COMPANIES—NOT ON THE LISTS OF THE BOARDS.

Bella Union Quicksilver M Co	Cal	2	10	June 28	July 30	Aug 25	A Halsey	312 Montgomery st
Con Bonanza M Co	Cal	1	10	June 28	July 10	July 31	W Martin	18 First st
Comanche M Co	Cal	1	50	May 24	July 2	July 27	W W Traylor	309 Montgomery st
Equator M Co	Cal	1	50	June 6	July 11	July 31	W Willis	309 Montgomery st
Excelsior S M Co	Cal	1	10	June 27	July 27	Aug 20	W A Kollmer	306 Post st
Jennie A and Black Rock M Co	Cal	14	50	June 5	July 9	July 30	J W Clark	413 California st
Knickerbocker S M Co	Cal	14	50	June 5	July 9	July 30	A Wissel	210 California st
Long Range S M Co	Washoe	2	3	May 21	June 25	July 17	F E Luty	507 Montgomery st
Lucky Rock M Co	Cal	2	2	May 30	June 2	July 21	C S Healy	Merchants' Ex
Mammoth S M Co	White Pine	20	50	June 4	July 12	Aug 7	D A Jennings	401 California st
Mariposa Land M Co	Cal	11	100	June 18	July 21	Aug 14	Leander Leavitt	309 Montgomery st
Minetta Belle S M Co	Cal	1	25	June 18	July 21	Aug 7	J G Riley	329 California st
Silver Sprout M Co	Cal	1	5	May 23	June 25	July 16	T B Wingard	328 Montgomery st
Ward Con M Co	Cal	1	50	June 21	July 27	Aug 17	C A Sankey	361 Montgomery st
Young America M Co	Cal	1	15	May 12	June 16	July 12	R H Brown	426 California st

## MEETINGS TO BE HELD.

NAME OF COMPANY.	LOCATION.	SECRETARY.	OFFICE IN S. F.	MEETING.	DATE.
Best & Belcher M Co	Washoe	W Willis	309 Montgomery st	Annual	July 9
Chollar-Potosi M Co	Washoe	W Willis	309 Montgomery st	Annual	July 9
Modoc Con M Co	Cal	E F Dickens	311 California st	Annual	July 9
North Con Virginia M Co	Washoe	R C Rogers	419 California st	Annual	July 9
Overman M Co	Washoe	G D Edwards	414 California st	Annual	July 12
Utah S M Co	Washoe	G C Pratt	309 Montgomery st	Annual	July 10
Yellow Jacket M Co	Washoe	T G Taylor	350 Pine st	Annual	July 16

## LATEST DIVIDENDS—WITHIN THREE MONTHS.

NAME OF COMPANY.	LOCATION.	SECRETARY.	OFFICE IN S. F.	AMOUNT.	PAYABLE.
Black Bear Quartz M Co	Cal	W L Oliver	316 California st	40	Oct 11
Consolidated Amador M Co	Washoe	F B Gordon	Nevada Block	2 00	June 15
Con Virginia M Co	Washoe	F B Gordon	Nevada Block	2 00	June 14
Comanche M & M Co	Cal	W W Traylor	Nevada Block	2 00	Oct 2
Empire G M Co	Cal	Chas Collihan	414 California st	1 00	June 16
Eureka G M Co	Cal	R Wegener	320 California st	2 00	May 10
Hile G M Co	Cal	J G Riley	320 California st	1 00	Mar 17
Leopard M Co	Cal	R H Brown	426 California st	50	Dec 11
Manhattan S M Co	Cal	J Crockett	419 California st	1 00	Feb 10
Modoc M Co	Cal	M McLaren	Cal and Moutly st	1 00	Jan 5
Northern Belle M Co	Cal	W Willis	309 Montgomery st	1 00	June 15
St Patrick M Co	Cal	D F Verdenal	409 California st	1 00	Mar 15
West Comstock G & S M Co	Washoe	Oliver G Wood	534 California st	50	Feb 24

## The Mining Share Market.

Transactions in mining shares have been very limited this week, as the San Francisco Board adjourned over from Saturday until Thursday morning, so that there were no sales on Monday, Tuesday, or Wednesday. What business there has been done has been without special interest, and fluctuations slight. The Nevada Board has resumed operations again after a cessation of two months. In the present state of the market there seems hardly business enough for three Boards. News from the mines continues favorable, and the situation on the Comstock is thus summarized by the <



# MINING SUMMARY.

The following is mostly condensed from journals published in the interior, in proximity to the mines mentioned.

## California.

### ALPINE.

**ADVANCE.**—*Alpine Chronicle*, June 29: This mine continues to look well. They are now running along the foot-wall, and taking out fine ore. The large new boiler will probably be at work to-day. The mill is doing good work, but the furnace is too limited a capacity, and the company will probably erect a new and much larger one as early as possible. The entire works of the company are always open for inspection.

**STREVSING.**—This mine is in about 200 feet, and it is thought that 15 or 20 feet further will bring it to the ledge. Its owners have worked faithfully this spring and deserve success.

### AMADOR.

**WILDMAN.**—*Amador Ledger*, June 30: Mr. Conise is in Sutter Creek getting things in shape to start up the Wildman. An incorporated company has been formed with 65,000 shares.

**OLIVE.**—Work has been suspended for the present. A clean-up was made on Saturday last, the result of which was not sufficiently encouraging to justify the continued prosecution of work.

**CROW'S POINT.**—We are happy to report a decided improvement in this mine. The last crushing came up to the paying standard.

**MAHONEY.**—The contest between the two factions of stockholders for the possession of this mine was decided by Judge Wheeler last week, in favor of the Stewart party. The late board of Trustees were declared illegally elected, and all their acts null and void. After a long and tedious session on the part of the ousted officials, the victorious party took possession of the books and other documents belonging to the company. The defeated faction gave notice of appeal, and asked for a stay of proceedings pending the decision of the higher court, which Judge Wheeler refused to grant.

**GRAND MINE.**—The dawn of more prosperous days has reached the Old Mine. The rich rock has been struck in the north drift of the 1000-ft level—richer, it is said, than any met with in the past history of the mine. The high grade ore is extensive, and the discovery comes just at an opportune moment, when an assessment is hanging over the stockholders.

**ORIGINAL AMADOR.**—From all that we could gather while in Amador city the other day, this mine has shown a decided improvement lately.

**MEEKS CLAIM.**—Some time ago we mentioned that a mining claim adjoining the Coney on the south was sold to W. A. Nevilles. A shaft has been sunk upon the property, and a fair-sized vein of paying ore discovered. A dispute has now arisen concerning the ownership.

**V. FURBER.**—The V. Furber of the Amador Lumber Company, for floating mining timber from the reservoir to Sutter Creek, is now receiving the finishing touches. One more week will see everything completed, ready for the reception of water. With the single exception of the raised flume of the canal company at New York ranch, it is the longest and costliest work of the kind to be seen either in Amador or neighboring counties. It measures a little over a mile in length, and required more than 100,000 feet of lumber in its construction.

**THE VOLCANO TUNNEL.**—*Amador Dispatch*, June 30: The great tunnel under the Volcano basin, we learn, is now in about 630 feet, or about one-third of the distance that they will have to run before striking the main gravel bed. The rock where they are now working is said to be very hard, and the progress is necessarily rather slow.

### CALAVERAS.

**CLEAN-UP.**—A clean-up was made in Veith's mammoth hydraulic tunnel ridge, this week, and the mine has been shut down on account of the failure of the water. We learn the clean-up amounted to \$5,000, which for a run of less than two months is a very handsome yield. Piping cannot be resumed until the fall rains set in.

**AND NOW EMERSON.**—Emerson, proprietor of the Happy Valley hydraulic, is cleaning up, but hasn't got through yet. The first instalment of the "product" of his mine came in town Thursday night. We didn't ask Emerson how much he had, but judging from appearances it couldn't have been less than \$6,000. And there's more coming.

**GWIS.**—Everything continues to progress most favorably at the Gwin mine. Splendid rock is being obtained, and there is every prospect of \$500,000 of it—this is the one now being worked—will prove the most remunerative of any since the mine was opened. The rock is of a higher grade than any previously mined, the ledge is wide and there is nothing to indicate a shortening of the pay shaft. The batteries are kept employed and work is actively progressing in every department of the mine.

**ROCK.**—We have the following returns from six crushings of rock at the Gwin mine: 1300 lbs. of ore from the Potter & Rodgers mine paid an average of \$30—taking the first and second grade ores together. Eighty tons from Gass & Co.'s mine yielded \$13 per ton. The rock was unassorted and the entire ledge—a wide one by the way—was taken out. The Gass mine is looking splendidly and really promises to be a valuable piece of property.

**FROM THE UPPER COUNTRY.**—We continue to hear favorable intelligence from the upper mining districts. At West Point Fields & Co. lately discovered a new ledge on Skull flat and have sunk a shaft 60 feet in depth upon it. The lead is two feet wide and pays an average of \$35 per ton. We have been shown a very rich specimen of quartz taken from the Hall & Lassey mine near West Point. The quartz is remarkably fine, and the ore is rich in sulphur. The tunnel is now in a distance of about 300 feet, uncovering a ledge two feet wide, half of which is composed of the same character of rock as that shown us. At the Champion sinking and stoping are being vigorously prosecuted with uniformly good results. A new tunnel has been run in the old Zacatero mine and the ledge cut. The quartz is splendidly. The new Zacatero mill is just receiving the finishing touches and will be in operation shortly. It is being supplied with all the modern gold-saving appliances. The shaft of the Enterprise Con. Co.'s mine has reached the depth of 100 feet. A sample lot of rock yielded an average of \$22 per ton. We understand that a San Francisco company is negotiating for the purchase of the Granite mine at West Point. At Railroad Creek the rock is about 100 feet on each. The Hemlock is now down 700 and the Wyoming 650 feet, and Mr. Davey and several other parties, who came from there a day or two ago, say that both mines are looking well, and the prospects for striking good ore during the progress of sinking are excellent. Davey & Co. commence the work to-day with 14 men and will push down as fast as possible.

### INYO.

**EMIGRANT MINES.**—*Coso Mining News*, June 30: Peter Taylor, Superintendent of the Emigrant company's mines, Lee district, has returned from San Francisco with instructions to re-commence active operations at the mill and mines at once. Accordingly men were set to work upon the mines, teams to hauling and men at the mill. Mr. Taylor has secured the services of Mr. Horatio Smith, whose long experience in Arizona and California has made for him a most excellent reputation as a practical millman and amalgamator. Mr. Smith has already gone to work; the developments in the Cactus and Valentine mines are excellent, and we expect to report in a week or two a valuable shipment of fine bullion.

**PANAMINT.**—Richard Davey & Co. have taken the contract to sink upon the Wyoming and Hemlock mines of the S. V. M. & W. Co., at Panamint, to a depth of 100 feet on each. The Hemlock is now down 700 and the Wyoming 650 feet, and Mr. Davey and several other parties, who came from there a day or two ago, say that both mines are looking well, and the prospects for striking good ore during the progress of sinking are excellent. Davey & Co. commence the work to-day with 14 men and will push down as fast as possible.

**MINING STRIKE.**—*Inyo Independent*, June 30: After almost two years of steady work and an expense of more than \$5,000, Chris. Crohn, of Cerro Gordo, has lately been rewarded by a valuable strike of rich ore. In the Enterprise, a mine situated in the San Lucas canyon, about three-fourths of a mile from the Belshaw furnace. The ledge carries galena and silver ore, and with a small force he is taking out about one ton per day, which pays \$15 per ton after deducting all expenses of mining, packing and reduction.

**REX MOUNTAIN BULLION.**—For the present season the little 5-stamp battery run by the Rex Mount Co. has produced 12,333 ounces of gold and silver bullion, which does not include a shipment of 4,800 ounces more to be made to-day. It will be remembered that the mill started but a few weeks ago, and from the foregoing statement of facts it is not content in the final verification of our prediction that the Rex Mounts will make for this season the best shipments of any quartz mill of equal size on the coast. It is an old rattletrap concern erected in the days of Lang Syne by the Silver Spirit Co., reconstructed for present uses. In the course of operations this week the mill power has been reduced by breakage to three old-style steam engines as the only means of producing bullion, but Boss Flint said that the new oil mill will not stop if he gets down to one. However, the pans are to be repaired and replaced soon, when the regular bullion shipments will be increased in number and value.

**THE YONACIO.**—The operations of W. A. Greenley upon the San Yonacio mine in Lower Cerro Gordo have resulted in the opening up of what is undoubtedly the main and most solid ledge which forms the basis of the immense mass of ore that has been struck in the mine. The ledge is now being extracted from it. The ledge is opened in the bottom of the old works stands nearly perpendicular; has been opened laterally for 30 feet, and shows an ore vein of 18 inches in width. The chlorido and native silver specimens shown will assay among the thousands.

**ELCISE.**—The mill is closed down for the present, pending the return of Supt. Nelson from San Francisco, who is expected every day. We believe that work is still progressing at the mine in sinking the bottom of the shaft, presenting a better ledge and a finer quality of ore than any other portion of the mine.

### NEVADA.

**THE RICH STRIKE.**—*Grass Valley Union*, June 28: A few days ago we made mention that Kece, Grant and two others had made a rich "find" of quartz, on the headwaters of Squid Creek, near this place. The find is the richest in gold that we have ever heard of. They have a ledge nearly five inches thick, which is filled with gold. There is as much, and sometimes more, of bulk of gold than of quartz, and of course the gold is much greater than the quartz when it comes to weight. Yesterday the owners of this remarkable bonanza shipped four bars of gold to the Swiss American bank in San Francisco, aggregating \$10,000 in value. That gold was taken out by hand process, in three days. That is really a ledge of gold which carries some quartz—incredible as such an assertion may seem. It is owned by a first-rate set of men.

**MACHINERY PURCHASES.**—Col. Berry, manager of the old Sogge mine, near Nevada City, has purchased the machinery of the Union mine and has immediately started it. In a few weeks he will be at work more vigorously than ever, taking out the pay stuff. The old Sogge is a good mine, and will be better now that it is to have better machinery.

**YUBA RIVER.**—*Foothill Tidings*, June 30: At 120 feet in the drift a raise was made in this river mine early this week, to reach the ledge and river reached. Eighteen feet found tailings but not the river bed. The ledge is now going on, and some more of the working fund stock will be sold to defray expenses. The "raise" has demonstrated the entire feasibility of this plan of river mining, and the few shares needed to raise money for carrying it through should find ready sale.

**HOMERIDGE BUNKER.**—Work has commenced in good earnest at this mine. Contractors are sinking the shaft, making good headway. The ledge in the shaft is large and well defined, showing finely in free gold and sulphurets. The machinery works like a top; the new buildings are nearly completed, and the Homeridge has every prospect of a fine mine.

### PLACER.

**A WOMAN STRIKES A MINER.**—*Placer Herald*, June 30: We understand that Mrs. Bissett, an elderly lady residing on Rock creek, who occasionally prospected around among the hills, made a strike last week and took out, up to last Saturday night, between \$400 to \$800. The deposit in all these respects resembles the formation in Bell's bonanza mine, and it is more than likely she will realize a very handsome stake out of this strike.

**MOLIN** is down on his ledge about 40 feet, and though rich from the surface, finds better rock in the bottom than he has yet taken out. He is troubled very much with water, owing to his inadequate means of hoisting. A remedy of this temporary trouble will put him in a way to realize his ledge.

**GRAVEL.**—*Dutch Flat Florist*, June 29: The Elmore Hill, Star and Union, and Baker claims continue washing. The Southern Cross and Polar Star claims are off, pending the preparation and explosion of a powder blast in each. The former exploded 480 kegs of powder yesterday, and the latter will explode 420 to-day, making a total in the two claims of 900 kegs.

**THE FRANKLIN** has been giving its main tunnel ahead, and is now raising an incline to the surface. The Superintendent intends to wash about four days longer and then clean up for the season.

### PLUMAS.

**GRANITE BASIN QUARTZ.**—*Plumas National*, June 30: Mr. F. Hill, of Meadow Valley, gave us a specimen from the ledge recently found by J. B. Bachelder in the Granite Basin country. The rock is certainly the richest we have seen lately, free gold being visible all over it. The vein is narrow, but it is holds ore, and the ledge is a valuable one. The rock now being taken out, and which will soon be crushed in the old Hallstead quartz mill, will probably pay from \$50 to \$100 per ton. Mr. Hill thinks the Buck's Ranch country, generally, is full of gold-bearing quartz lodes, and if thoroughly prospected, a quartz district will be opened second to none in the country.

**SPANISH CREEK.**—Our correspondent says: "The Blackhawk boys are doing splendidly in their claims. This last week they took out one piece weighing \$33, and a good many smaller ones. Cashman is now running a tunnel in Michigan hill, and it pays well. If he had a pipe-head of water he would make more money than any man around this section, and as it is, he has a claim that will pay well and prosperously worked. A China company has located a new claim in the bed of the river, and report says that they are making money. The Maxwell company are reported to be doing splendidly in their new mine. Their pipes are running day and night. Nash has a quartz mine that promises well."

## Nevada.

### CORNUCOPIA DISTRICT.

**NEW STRIKES.**—*Cor. Silver Star*, June 30: The new strikes made lately just north of town are developing splendidly. If they turn out as well as expected they will be a great help to this place. One the Runa, located by Phil Sullivan and Wash Northop, who have sunk a shaft on it about 20 feet, which shows the ledge to be four feet strong, with ore that assays from \$150 to \$500 per ton. They are still sinking and intend to ascertain whether they have a permanent mine or not. The other claim adjoining on the same ledge was located by Steve Turner, John Owens and John Pritchett. It lies about as well as the first mentioned, everything else is the same, and we think this camp could bear prosperity a little while at least.

### ELY DISTRICT.

**RAYMOND & ELY.**—*Pioche Record*, June 30: Everything is looking encouraging in this mine. Are extracting

much more than usual. The work of drifting both east and west on the new strike on the lower level is being pushed on rapidly, success attending the work and getting a fine amount of good ore. The mill is running 15 stamps and half of the pans on ore, the other pans and settlers being used on tailings. Battery samples of ore from the upper levels now being worked at the mill average \$120 per ton. At the concentration works of Hugh White, on tailings of the Raymond & Ely, the new pump has been placed in order and has been working successfully for the past several days. The water that is wanted, the work of concentrating being successfully in consequence. Concentrations are being shipped every day.

**PIOCHE BULLION.**—Wells, Fargo & Co. shipped bullion from Pioche during the past week valued at \$19,484.

**MILL LEASING.**—On Wednesday last Superintendent Blair informed us that the Trustees of the Alps company had succeeded in procuring the American Flag mill at Bullville, and that it would immediately be placed in repair and started to work by Monday if possible. The shipment of ore commences immediately and continues right along, so as to keep the mill steadily running. The intention of the Superintendent is to start the mill as above stated, and to make repairs constantly until it is in thorough order. The company has plenty of ore, and of a good quality, to run the mill, and they intend giving a good amount of the week's pay long.

**ALPS MINE.**—Notwithstanding the disaster to the Concord mill the work on the mines has been prosecuted vigorously during the week. Retrimbering some of the stopes is going on, some of which they have not been able to touch yet for lack of time, still from those that have been fixed they are enabled to extract 20 tons of ore daily, which will be increased when the stopes are fixed. The shipments of ore commenced to the American Flag mill (15 stamps), last Thursday, having sent 65 tons that day and 65 tons yesterday, leaving 70 tons on the dump. Shipments will continue, so as to have the mill kept running regularly. The body of ore in the mine is looking well.

### OSCEOLA DISTRICT.

**WATER.**—*Pioche Record*, June 30: We learn from Osceola that all disputes about placer claims have been settled amicably and that no further trouble is anticipated, as all claims are located and worked. Some claims have the dirt jerked from them to water and others have the water jerked from them to dirt. The water from the lake on Jeff Davis peak has been abandoned, as the expense would be enormous, and there being no source of supply for the lake there is no telling how long the water would last after being brought down the mountain. The five-stamp mill is about ready to work and will probably start up to-day, the 30th inst.

### PEAVINE DISTRICT.

**RENT.**—*Reno Journal*, July 1: From Peavine we have good reports. In the south drift on the Con. Poo a large body of fine black ore has been uncovered. It assays nearly \$200. The outlook is very flattering, and our predictions that Peavine is one of the richest mineral sections of the State will soon be verified.

### PYRAMID DISTRICT.

**BODY OF ORE.**—*Reno Journal*, July 1: At Pyramid the Buckeye has struck a magnificent body of ore, which so closely resembles Con. Virginia rock that an expert alone could tell the difference. It was found on Friday in the drift, in a distance of 20 feet from the bottom of the shaft, which is down some 135 feet, and makes the ore body about 250 feet below the surface. Yesterday morning the ledge had been cut for seven feet, and it is the opinion of Palmer, the Superintendent, that the ledge will be over 40 feet wide, and that before he gets through it rock will be taken out that will assay over \$1,000 to the ton. Several boxes of the ore were brought in yesterday, and the strike was made on Friday. The mine is about a mile from town. Assays were made of \$80. The Jones and Rinkind mine is also showing well. The west wall has been reached, but the other is not in sight. The ledge is, so far, 45 feet wide. Mr. Jones, the Superintendent, has quit cross-cutting and gone to sinking on the ledge, and will open out the 200-ft level as soon as possible. The rock we referred to yesterday, assaying \$600, comes from the China claim and is found right upon the surface, the ledge cropping out as high as a house. Bob Ash got returns from Wiegand yesterday from another piece. His certificate shows \$470.20.

### TUSCARORA DISTRICT.

**DE FREES.**—*Virginia Enterprise*, June 30: Reports from the De Frees mine, Tuscarora district, are of the most encouraging character. It joins the famous Grand Prize, and is being managed most successfully and economically. The four-stamp mill of the company is running on ore from the mine, the assays from which average \$132 in silver. Two hundred tons of ore are also being shipped to the Leonard mill at Cornudas. A prominent millwright from San Francisco is on the ground for the purpose of selecting a site for the immediate erection of a 10-stamp mill, which will be so constructed that 10 additional stamps can be added at any time without much extra expense. The new hoisting machinery is en route. With it more rapid progress can be made and greater depth attained than with what is now used.

## Arizona.

**McCRACKIN.**—*Arizona Enterprise*, June 23: The McCrackin Co.'s mill at Greenwood is running steadily. On account of some trouble with the battery, not more than an average of seven stamps were run during the month of May, and the mill yield during the month was 15,000. The mine has over 14,000 tons of ore on the dumps and broken down in the mine. This ore yields an average of \$55 to the ton. The grading for the new 20-stamp mill will commence on or about the 1st of July, and when this mill is completed the company expect to work an average of 80 tons daily, in the two mills. Two new pans are to be put up at the mill. A new assayer has been secured, and a large quantity of tailings will be worked. The Signal M. Co., who own the San Francisco location on the McCrackin ground, have completed grading for the ten-stamp mill, which is to be put up on the Sandy, about half a mile below Fisher's Springs and about three and a half miles from Greenwood. A town has been started there, called Nashville. Mr. William Allen has the contract for building it to some place convenient to the Signal company. He is interested in both companies. The mills are to be built under the supervision of Mr. Patton, who is an experienced millwright and built the mill for the Consolidated Virginia, on the Comstock.

**BRADSHAW BASIN.**—The Luke Co.'s mill is nearing completion. The company have employed, including mechanics, miners, laborers, etc., 15 men. There are 15 men working on the Gretna mine and there are 300 tons of ore on the dump that will work from \$75 to \$100 per ton. The ore assays from \$31 to \$366 per ton, and the ledge shows a three and a half foot vein of milling ore. The 15 men average ten tons per day.

**AZTEAN MINE.**—*Arizona Miner*, June 22: Although the Peck company have talked about taking the Aztean mill down and moving it to some place convenient to the Peck mine, no definite arrangements have as yet been made to that end. It is highly probable that the mill will still be kept, for a time at least, where it now is.

**LUCKY ORE.**—The mines in Mohave county still continue to look up, and we have the information that the Hackberry mine is producing largely of ore, and by the middle of August will be up to the 500 to 2,000 tons of first-class ore. The ten-stamp mill will then be erected and running.

**BULLION.**—*Yuma Sentinel*, June 23: The El Dorado Canyon folks took \$17,000 worth of bullion from their nine-stamp mill last month, and their mine is getting better. Their great difficulty lies in getting fuel for making steam. They have already employed collectors to get wood that comes down the Colorado from the Rocky Mountain region, and which is intercepted opposite their mill.

## Colorado.

**VIRION TUNNEL.**—*Colorado Miner*, June 23: This is a prospecting enterprise on Leavenworth mountain. It is

located between the Robinson and Broadway tunnels, and cuts the mineral veins of that locality nearly at right angles and about 80 feet deeper than the Broadway tunnel. The mine is in a direction 20° west of north, and is now about 300 feet long. Five lodes have already been passed.

**THE WHITE LODE.**—The cross tunnel which has been run for the past six months "riven into the Republican for the purpose of cutting the White, is now nearly completed, and we may expect any day to hear of another big body of ore exposed. The vein will be cut at a depth of 300 feet below the surface of the discovery. The ore is good and the vein frequently large.

**GRX, GILBERT** is laying the foundation for his engine and hoisting apparatus at what is intended to be the main opening on the Free America. It is located 150 feet west of the discovery shaft. Miners are at work sinking at that point, and raising from the west workings, in the discovery, in order to connect the two as soon as possible. A new ore-house is being erected at the Boulder Nest mine. The fast mill run from this mine gave a result of 278 ozs. silver per ton.

**SILVER ORE TUNNEL.**—A good lode, carrying a fair-sized vein of ore, has been met with in this tunnel.

**CASHER.**—The huge rock which a few weeks ago slid from its position on Sherman mountain, smashing the Casher shaft-house and covering the mine, has been broken into smaller fragments.

**MARTIN.**—Good ore has been found in the Martin lode on Leavenworth mountain. A test made last week gave a result of over 1,000 ounces.

**TERIBLE.**—Work is being pushed on and everything got in order for work on a large scale. New Trail tracks have been laid in the tunnel, and the ore-house, shops and offices at the mine have been fitted up. The water coming down from the creek has given some trouble, getting into the mine and drowning out the lower portion.

**THE Union Tunnel** is being worked by nine men, and is rapidly approaching the Terrible lode, to intersect which vein it is being driven.

**MAMMOTH.**—About the middle of last month work was resumed under the management of Messrs. Teal, Foster & Co. The tunnel and Brown gulch intended to intersect this vein, and on Friday, June 22, the tunnel was driven about 20 feet, the south wall of the lode was cut into; since then the tunnel has been driven through the lode, and revealed a large body of ore varying from 9 to 18 inches in thickness. The ore in appearance is very like that produced from the large lode being worked in the East Tunnel; it is of low silver contents, but rich in lead.

**EARL TERIBLE.**—Work on this property has been steadily pushed along. During the past month there have been about 19 men employed, drifting, sinking and stoping, and the produce of the mine has been about 15 tons of ore.

## Idaho.

**ENCOURAGING.**—*Owyhee Avalanche*, June 30: The most encouraging event connected with the progress of mining operations in this vicinity that we have been called upon to record for many long months is the action of the Golden Chariot mining company in taking steps to sink their shaft a distance of 200 feet below the 13th level. At the Potomac there are about 30 tons of rich rock on the dump awaiting crushing. Work is being prosecuted at the mine under very favorable auspices. Along a distance of 600 feet on the ledge operations have been attended with the most promising developments.

**OPERATIONS** are still in favorable progress at the Empire, and the mine is looking better than ever. There is a large quantity of rich rock ready for crushing, and bullion shipments will soon be heavy.

We have favorable reports from many small mines in this immediate vicinity, and some freshly located claims, the prospects in some of which are unusually good. Some rich placer claims have been located by J. Brown and others at Sucker creek, about 20 miles from town.

## Montana.

**PHILLIPSBURG.**—*Butte Miner*, June 19: Everything is in statu quo here as yet. How much longer this state of affairs will exist it is indeed impossible to conjecture. What the Northwestern company will conclude upon, who shall or can say? Will the mill be put to work or not? Will the company crush or buy ore of the miners, or will they content themselves with treating their own rock? When Mr. I. Lewis was over here on business for the Northwestern company, he employed some six or eight men at the mine for the purpose of connecting (by drift) what is known as the No. 2 shaft with the incline. This work is being done for the purpose of facilitating the hoisting of ore, as there is a whim on the shaft. Rumor states that the present Superintendent of the Hope company will be clothed with full power on or about the 1st of the coming month. Work is going on at the Algonquin, Salmon and Shawtown lodes. Some representation is also being done by various parties in different sections of the camp.

**MONROE MINE.**—From Mr. Logan, Superintendent of the Monroe silver mining company's mill and mines in Vi pond district, we learn that it is the intention to again start the mill the latter part of the week, or the first of next. The mill itself is in good condition, and ready to run, but the employment of the ore is not yet made up from the mine to the mill has been in such an immense shape for the past two months that it was impossible to haul any quartz. During this delay a large building has been erected, in which to store ore, above the mill and having shutes leading to the battery floor. This will be kept well supplied with ore in the future, and obviate the necessity of stopping the mill when the ore becomes impossible for a few days. The company are employing about 15 men in their mines now, and are taking out considerable ore, which will be put through when the mill starts. It is the intention, however, to do some custom milling after everything is brought down to a certain basis.

## New Mexico.

**NEW DISTRICT.**—*New Mexican Herald*, June 16: Dooney district is in the Mogollon mountains, Grant Co. Distance from Silver City by wagon road, 65 miles north; 25 of which wants working. \$500 will do the work. From the mines to the "Frisco" river, six miles, road required can be built for \$200. At that point there is a good water power—sufficient to run 500 stamps. Wood abundant for lumber and fuel at mines and mill. The leads are extensive. The first lode, ready located, the Copper Queen, Copper King, Silver Twig and War Cloud have been traced a distance of ten miles. They are in granite and porphyry and in that distance are crossed by five perennial streams. Deep creek at lowest stage runs 250 inches; Copper creek, lowest stage, 30 inches; Mineral creek, same stage, 400 inches; Silver creek, 25 inches; White Water, 700 inches. These streams empty into an empty canyon at the "Frisco." In this vicinity there is the greatest abundance of grass.

## Oregon.

**AUBURN.**—*Cor. Bedrock Democrat*, June 27: Gold was discovered in Griffin gulch on the 23d day of October, 1851; the mines in Blue canyon and other gulches in the vicinity were found in the following spring. This attracted a large immigration, and in the fall of 1862 Auburn was the second city in the State in point of popula-



## Mining in Sierra County.

A correspondent of the San Juan Times, writing from Downville, Sierra Co., says: Dull as have been the past years in the history of our town and county, a few brave souls have clung to its fortunes most tenaciously, firm in the cherished belief "the darkest hour precedes the dawn," and that a new golden era was in store for old Sierra, which, next to Nevada, now promises to become the second banner mining county of the State.

The river claims are yielding rich returns this year, and others are doing proportionately as well. The celebrated boring apparatus at Galloway's hill, five miles southeast of Downville, is now in fine working order on Bald Mountain Extension ground, and, at last accounts, was down about 60 feet. A hard boulder was struck a day or so ago, but was drilled through most beautifully, and now, with uninterrupted progress, the Pliocene Co. are slowly but steadily piercing the bowels of the earth in search of the extension of the rich ancient river bed, now enriching the lucky owners of shares in the far famed Bald Mountain at Forest City, the resurrection of whose fallen fortunes, from an almost deserted village to a miniature Virginia City, is about as wonderful as the most bewildering Arabian tales. The mountains, for miles and miles, are swarming with prospectors, on the lookout for chances to locate claims; and judging by the rapid rate in which the ground is being taken up, there will be precious little left for the "last man," who ever begins so conspicuously in the history of the times. If, as is confidently hoped, rich ground is found by the Pliocene Co., a fresh impetus will be given to prospecting in all directions, only equalled or excelled by the days of '49.

The Pliocene company is composed of leading San Francisco capitalists, who have come here with the determination to work shoulder to shoulder with us in developing the mineral resources of Sierra. They have bonded some over half of Bald Mountain Extension ground, on 18 months' time, in the sum of \$45,000, and are now busy in good earnest, having already started a small village near where it is supposed they will have to sink their shaft. If gravel is not struck on first trial by the boring machine, their motto will be "try, try again," till it is, or the fact thoroughly demonstrated that all our fairy castles have been built in vain; that the theory of the existence of a rich lead thereabouts is but a delusion and a snare. May their laudable efforts be rewarded with the success that perseverance and energy ever deserve, is the sincere prayer of every well-wisher of our county's prosperity. Mr. Thurston, Superintendent of the Pliocene company, and one of the gentlemen deeply interested in this mining scheme, is well qualified for the arduous task before him, and by his courteous demeanor and unassuming ways during his brief sojourn in our midst, has already justly won the esteem and friendship of all who have been honored with his acquaintance. If rich diggings are developed at Galloway's hill, and most every evidence points strongly now that way, a road will be built to Downville from the new gold center, which will materially assist in resurrecting our county from its present state of despondence and stagnation.

**A NEW RAILWAY SIGNAL.**—Another invention pertaining to electricity, quite as wonderful as the telephone, though, perhaps, less calculated to attract public notice, has recently been secured by patent in the United States to a Swedish inventor. The apparatus is an automatic railway signal, which enables the station officials to know the precise position of any train at any time. It gives sound signals to the engineer, and at the station before the train enters, thus enabling switches to be cleared and arranged in time to prevent accident. If two trains approach each other, whether running in the same or opposite directions, the engineers of both the trains receive signals in time to prevent collision, and the station people are at the same time automatically informed of the position of both trains. Any train may, by stopping at certain points of the road where "contacts" are arranged, open telegraphic communication with the station at both ends of the route, and two trains may in the same manner telegraph to each other. A complete record is automatically kept at each station of the speed of each train, and of the exact time it enters or leaves the station. Stop signals may be sent at any time from the stations to any train while moving. The apparatus may be arranged to send stop or danger signals to trains approaching swinging bridges which are not properly locked and fastened.

**NEW DIGGINGS.**—A letter dated Telegraph creek, Cassiar, June 5th, says: Some parties have arrived from Lake Town and report the excitement intense at these mines, owing to the discovery of two new creeks said to be about 40 miles west of McDame and Snow creeks, which are paying three companies from \$32 to \$40 per day to the hand. A miner by the name of Stevenson and "Kelly the Rake," are the discoverers. A nugget of \$500 is reported.

**THE MOLDERS' Union**, of Troy, New York, one of the strongest in the country, has resolved to allow members to work in any shop on any terms, which is a virtual dissolution of the Union. This action ends a strike of eight months' duration.

## THE ENGINEER.

## A New Transandine Railway.

A revival seems to be approaching the South American railway building industry. We notice that our English exchanges are writing articles on the enterprise and industry of Harry Meiggs, and he may be an object of renewed interest to English capitalists. More than this, we read of a new road across the Andes, which will complete the connection between Valparaiso and Buenos Ayres. The section between Santa Rosa de los Andes, the present terminus of the Valparaiso railway, and the town of Mendoza, at the other side of the Andes, comprises the most difficult part of the road. Starting at Santa Rosa, situated at the entrance of the Uspallata pass, on the Chilean side, at 2,704 feet above the level of the sea, the line follows the course of the river Aconcagua for a distance of 33 miles, until it reaches the foot of the pass at 7,315 feet above the level of the sea. In this point where the Aconcagua river receives the Juncal the line follows the course of this river, turning to the south, and after 11½ miles turns again to the east until reaching the western portal of the large tunnel at the summit, situated at a height of 11,484 feet. The difference between Juncal and the mouth of the tunnel is 21½ miles, a grade of 3½ per cent. The length of the tunnel is estimated to be 10,665 feet. The top of the mountain is 3,260 feet higher. Crossing the tunnel the line descends to the Cueros valley, with a grade of 3 per cent. for eight miles to the bridge over the river Cueros. The altitude of Cueros valley is 10,257 feet. From this point to Puente del Inca, a distance of 12 miles, the grade is 2½ per cent., and continues softening till it reaches the town of Mendoza, 102 miles from Puente del Inca, and 2,500 feet above the level of the sea.

An Italian engineer, Mr. Olivieri, has recently made a new survey of this route, comprising only the mountain region between Juncal and the Cueros river, and has proposed to shorten the line 44 kilometers, avoiding all the difficult part, and thus reducing the cost of construction considerably. His plan is to start at Juncal river, 2,240 meters high, with an inclined plane, as invented by the celebrated engineer, Mr. Agudio, and recommended by the several engineers commissioned by the Italian and French governments, as well as by the delegates of various railway companies who attended the series of practical experiments that took place in the month of August, 1875, at Lanslebourg, Savoy. The inclined plane would have a length of nearly 6,000 meters, with only one curve of 450 meters radius, and of various grades, the heaviest being one in five. An altitude of 1,000 meters being gained in this manner, the line would continue 3,000 meters further with a grade of 1 in 36, to the entrance of a tunnel which would have a length of about 3,750 meters, and emerging at the side of the Cueros river at 3,180 meters high. This shows that the valley at the eastern side of the mountain is about 1,000 meters high, which is, to a certain point, an advantage, requiring only grading on one side. Both the Juncal and Cueros rivers would at all times furnish ample water power to work the turbine water wheels, with which power the cars would be lifted. There is also a small lake at the summit of the incline, the water of which can with facility be applied to the same purpose.

With this system the cost of construction would be reduced some \$4,000,000, and, according to the report of the joint committee of engineers, the working expenses of a line of this class, taking into consideration the corresponding development required in the other system, are in proportion very much less.

**PROPOSED NARROW GAUGE.**—The St. Louis Board of Trade is urging the project of the construction of a narrow gauge railway from St. Louis to Colorado, through Missouri and Kansas. The construction of this proposed railway through Kansas to Trinidad, in Colorado, will give St. Louis direct railroad connection with the entire system of narrow gauge railways in southern Colorado and open up to their smelting interests the whole range of valuable mining country of Colorado, Utah and Arizona. This road is but one item of a grand onslaught which St. Louis proposes to make upon outlying regions. The St. Louis Journal of Commerce says: "The jetties of South pass have assured ample water for all vessels to enter the Mississippi river and made a direct trade between St. Louis and all European ports practicable, and it becomes the duty of St. Louis to seize upon this advantage and develop herself a commerce which shall absorb her from all dependence on the Eastern seaboard. Her efforts in this direction will be greatly assisted by the building of the proposed narrow gauge railway, penetrating, as it eventually will, by means of the numerous branches proposed to be connected with its main line, the most fertile regions of Missouri, Kansas, Nebraska and Colorado."

**THE JETTIES.**—From the latest reports from Capt. Eads it appears that in 60 days a ship drawing 22 feet of water can pass from New Orleans to the sea. The addition of another foot or two to the depth of the channel will only be a matter of time.

## Moving Cleopatra's Needle.

Engineers of the present are about to attempt a problem which Cleopatra's workmen successfully solved. A correspondent writing from Alexandria, Egypt, gives the following account of the arrangements prepared for transporting Cleopatra's needle to England. The "needle" is a monolith 69 feet long and eight feet square—not uniformly, but at the base. It weighs about 220 tons, and lies in the sand 15 feet above high-water line. To get this mass safely into the sea and across the sea, it is intended to build up around it on shore a cylindrical iron case or ship, and then to roll the entire mass, nearly 300 tons, into the Mediterranean, and when the necessary ballasting and additions have been made to the ship in dry-dock, to have her towed to England. The iron vessel is now being made at the Thames Iron Works, and when ready will be sent out here in pieces, to be built around the obelisk, under the superintendence of Mr. Wayman Dixon, brother to Mr. John Dixon, the enterprising designer and contractor. The vessel must be considerably longer than the obelisk, because of the shape of the stone. It will be 92 feet long and 15 feet in diameter, with plates three-eighths of an inch thick. It will be divided into nine watertight compartments by eight bulkheads; total weight of iron, 75 tons. To lift the end of the obelisk jacks of immense power will have to be sent from England, and after the cylinder is built tremendous tackles will be required to roll it into the sea. It will float in nine feet water, and to reach this depth it must be rolled 400 feet. Once afloat and in dock it will be fitted with bilge keels, rudder and steering gear. It will be cutter-rigged, with one mast and two sails, and will have a deck-house for Mr. Carter, who will have charge of it on the voyage; for, although it will be in tow of a steamer, it will be in every respect a ship, and able to take care of itself for a time in case of accident or breaking away of the tow lines, which are to be of steel wire. If the undertaking is a success, the entire expense will be borne by Mr. Erasmus Wilson, the eminent surgeon. Immense care and nicety will have to be exercised in obtaining the necessary strength and rigidity; the obelisk must be so packed, forming with the iron cylinder one solid mass, as to avoid any strain from the rolling into the water, or from the heavy working of the ship afterward. I presume the most anxious part of the work will be to get the vessel and her precious cargo into the sea. Once afloat other difficulties will be mastered. Three thousand five hundred years ago this obelisk formed one of the pillars in front of the great Temple of Tum (the setting sun), at Heliopolis (near Cairo), and was brought to Alexandria during the reign of Cleopatra. No accounts exist of the appliances used; but if this and larger monuments could be safely moved about some 1,600 years B. C., it is not possible to doubt our ability to do likewise in the 19th century A. D.

## Splicing Wires for Bridge Cables.

Work is progressing rapidly on the Brooklyn bridge. The wire, as it comes from the factory, is in coils, containing about 1,000 feet. As each coil is oiled it is drawn to the top of the anchorage and placed on a flat drum which moves horizontally. From this drum the coil is wound with great care over a wheel four feet in diameter, moving about a horizontal axis. This wheel and its carriage are placed in position before one of the drums. It is then necessary to fasten the end of the wire to that already on the drum. A workman steps up with a double vise, in which he puts the two ends of wire which have been previously threaded, and joins them by a hollow nut of crucible steel two inches long and an eighth of an inch thick. The inside of the nut is threaded in opposite directions, to conform to the threads on the ends of the wire. The nut is then fastened in a hand vise, by which it is screwed up so as to bring the two ends of the wire almost together. By aid of this contrivance the joint is given 96 per cent of the strength of the wire. When the fastener steps to another drum, a man, with a box of chemicals and acids, cleans the joint. Then another, with a pot of melted zinc, gives the joint a bath, in which some chloride of ammonia has been thrown to destroy the dross. Another man, with a tool, runs the zinc well on to the wire to galvanize it thoroughly. Next a man, with a pan of linseed oil and a piece of sheep's skin rug dripping with oil, seizes the wire where it has been joined and holds it fast in his oily grasp, while the other workmen carefully wind it from the small reel to the large drum.

Although the popular impression is that the cable is to be of twisted strands of wire, the contrary is true. The wires are kept parallel, and as soon as 133 wires are sent across the river they will be tied with temporary wrappings. These will make one of the 19 strands of which one cable is made. There are suspending pendulum rods from one of the wires to prevent the entangling of the wires as they pass to and fro and are fanned by the wind.

There are now four wires in position on each of the down-stream cables. These are the first wires that have been put up that will enter into the big bridge's ultimate structure. It will take about two years to carry across the 24,000 wires.

## Two New Bridges at Rotterdam.

Dutch engineering skill and enterprise have just completed an undertaking of a magnitude second to none of the many great works achieved by the Dutch before. It is well known that for centuries the Dutch people have waged constant war against the encroachments of the sea and the rivers by which their country is intersected. The hydraulic works are the first in the world; their bridges at Kutphen, Kuylenburg and Maesdijk rival those of America. The Builder says: Another, the new railway bridge which crosses the Maas at Rotterdam, has just been added, which was formally opened on April 29th, and the importance of which for Holland need hardly be pointed out. The work, after an expenditure of 2,000,000 florins (£160,000), of which rather more than half has been expended on the superstructure, and less than half for the substructure, has been completed within eight years, about the same time required for the construction of the similar bridge at Hamburg, and that between Venice and the continent. Five gigantic wrought-iron arched girders, resting on granite piers, and of spans ranging from 216 feet six inches to 295 feet four inches, and a height of nearly 20 feet above ordinary high water level, connect the city with an island in the middle of the stream, two other arches uniting this island with the opposite shore. Another great work at Rotterdam is now in course of completion, which has attracted general attention on the continent. A few paces below the railway bridge, another bridge, the so-called "Willemshbrug," to serve for the ordinary carriage traffic of the city and foot-passengers, is in course of construction. The foundation-stone of this bridge was laid three years ago by the king of Holland in person. This, like the railway bridge, is provided with two pivot arrangements, of which one is within the city and the other in the canal called the King's Harbor (Koning's Haven), 656 feet wide, between the opposite shore and the island above mentioned, to permit the passage of the largest ships.

## The Krom Concentrator.

The Krom concentrator, now in operation at Somehow, near Jefferson City, is attracting a good deal of attention from all who own silver-bearing lodes requiring concentration before being placed upon the market. It has proved a success beyond a reasonable doubt. It has been tested upon all kinds of ores, tailings, etc., and the result has more than met the sanguine expectations of the Montana company or the claims of the inventor and patentee. Ore concentrating machinery has been one of the problems of the mining age, for without some method of concentration ores bearing but a small percentage of mineral have been of no value, in fact an incumbrance upon the dumps. It was also apparent that the rich bodies of ore are less common than lean ones, and in many mines the cost of reaching their rich pockets was more than the ore taken from them was worth. With limited milling facilities and an unusually large quantity of base metals in all the mining camps of Montana, concentrating works are of the highest importance; in fact, an absolute necessity to her prosperity. Even milling ores rich enough for shipment contain a large per cent. of refuse matter, upon which heavy charges have to be paid for freight, and thus lessen, in no small degree, the profits on all the ore sent abroad for reduction. Mr. Krom's invention seems to be well adapted to the purpose of accomplishing this object, and we fully believe the present machinery is but the forerunner of much other of like character that will be in operation here in a year or two. Here is a fine field for capitalists to turn their attention to profitable investments. There is an abundance of ores to crush at Vipond, Butte, Runley, Comet, Clancy and many other points, and concentrators doing custom work could be kept constantly running. We know of no country that presents so many inducements to capitalists as Montana does at present. Because there is here room for plenty of milling machinery and concentrating works, and plenty of lodes that can be purchased at low rates, because the owners are unable to develop and work them.—*Helena Independent*.

**BELL RUN.**—A correspondent of the Silver State, writing from White Rock, says: Times up this way are pretty dull, partly owing to the fact that mining companies do not pay regularly. Since the 1st of June the Leopold company have reduced their working force considerably, and are carrying on their works as economically as possible. Wood delivered at the mill commands the following prices: pine, \$13; fir, \$11, and cedar and other wood, \$10 per cord. As the wood in this vicinity is principally fir, it makes it hard on those engaged in the wood business. Last year fir sold readily at \$12 per cord. From all reports we are going to have a new camp in a very short time, which bids fair to benefit the people more than the Leopold or Hussey. It is to be at the Mountain Laurel mine, owned by Duncan & Co., which experienced miners say is the best prospect in this part of the country. They have about 300 tons of ore on the dump, and are making arrangements to have it worked at the Vauce mill, at Mountain City. It is believed that the property will change hands inside of twenty days, and that a mill will be built near the mine. A lot of ore from this mine worked at Mountain City yielded \$140 per ton.



## California at the Philadelphia Exposition.

We find in the Philadelphia Press the following paragraphs. One of the noticeable attractions of the exhibition is the California pavilion, which is situated near the musical platform and in front of the Log Cabin. It is made of oak-barked cedar; the roof is thatched with moss from Monterey, and a spire of vines extends far up into the rotunda of the main building; its rustic posts are ornamented with flowers, cones, vines and feathery pampas grass, and its entire arrangement is indicative of the artistic skill of its proprietor, Mr. J. R. Begg, who is well acquainted with the productions of the Golden State, having been a donor there for many years. He exhibits a fine collection of Languedoc almonds, Malaga, Genoa and Sicily lemons, and Mexican limes, all raised by Mrs. Geo. C. Swan, in Paradise valley, San Diego county, California, and if the flavor and taste of these fruits partake of their native soil, their brightness must be a paralytic to the eye in the land. Magnificent pine-apples, dates, oranges and lemons are also exhibited and for sale at this pavilion. Suspended from the roof is an enormous Pimento orange, which measures 23 by 24 inches, and was grown by Mrs. Brewster, of Paradise valley, Cal. It is really a prodigy of nature, but whether it is as good and luscious as the other fruits from the same place remains to be found out, for no five as yet has pressed it to her rosy lips.

Another novelty is truck soap, a natural production, which is dug out of the earth in southern California, and without any preparation is excellent for scrubbing up things in general, but particularly for polishing silverware. Any one having a bed of this useful mineral on his farm need have no excuse for dirty hands.

There is also to be seen here a specimen of the *Yucca brevifolia*, which is found in large quantities in the dry, sterile sand of the Mojave desert, where nothing else will grow. It is valuable as a paper-producing plant, and there is now a company organized in California for the purpose of supplying the newspapers of the world with pulp, which they are quite able to do. Mr. Begg has on hand pretty little card baskets and fancy articles made out of walnuts, which are cleaned, sawed, varnished and curiously wrought together; also a large variety of canes, boxes, sleeve buttons, Centennial bells, goblets, etc., manufactured from the celebrated Big Tree. These articles are sold at moderate rates, and are very desirable as mementoes of the exhibition and our beautiful sister State lying along the Pacific.

Everybody has heard of the wonderful Big Tree, and it is a fact that if some of the fallen trees in the Calaveras grove were burned out a man could ride on horseback—ride for 200 feet, and come out at a knot-hole in the side. Their bark is 23 inches thick, and, when crumbled up, makes excellent material for stuffing pin-cushions. An olive tree, in bearing condition, is now on its way from California, and will be added to the display next week, while fresh fruits will arrive from time to time during the summer.

Mr. Begg is a man of large experience and extensive information, and the many visitors who daily call at the Pavilion, find his conversation as attractive to their mental appetites as the rich tropical fruits are to their palates.

**STORM SIGNALS FOR MINE USE.**—It has been decided in France to send notice to the various coal mines of any sudden fall of atmospheric pressure recorded at the several meteorological observatories. It is well known that the outflow of fire-damp is greatly increased by a sudden fall in the atmospheric pressure, and nearly all fiery mines now use the barometer as an indicator of the amount of ventilation required. In addition to the barometer readings at the mines the Government weather report, which would indicate the approach of a dangerous atmospheric disturbance before its arrival, would, no doubt, in some cases, be the means of preventing dangerous fires and explosions in mines producing fire-damp in large quantities. The matter is worthy the attention of those in charge of such collieries, and no doubt, upon suitable application the Government would send such reports to the principal mining districts interested.

**CARBONATE POINT DISTRICT.**—This new district is situated about ten miles west of Ellsworth, Nye county, and six miles south of Lodi. The Belmont Courier says: From reliable information collected from parties who have visited the mines they must be of immense value, thousands of tons of ore being in sight. Average assays from the Lizzie ledge give \$141.45 per ton in silver and 96 per cent. lead. Average assays from the Western ledge give \$131.93 per ton silver and 84 per cent. in lead. The owners are sacking ore, without selecting it, to the reduction works at Sacramento, where they get the highest rates offered at the reduction works, 90 cents per ounce for fine silver and no charges for reduction. The Illinois company only get 75 cents per ounce. Water is scarce, being five miles distant, and by sinking 80 feet plenty of water can be obtained. Wood is abundant three miles from the mines.

The proprietors of the Sturtevant house, New York, announce that they will have no bills against army officers who may become guests of the hotel until after Congress votes an appropriation for the army.

## USEFUL INFORMATION.

## The Science of Floor Scrubbing.

"Top-dust" can be washed off without great labor. Have the water only moderately warm, especially when the floor is of soft wood, because hot water sinks so rapidly, and occupies so much more time in drying, than cold water upon wood. Drain the mop pretty well before putting it upon the floor, thus wetting the floor but little. The object is to wipe up the dust as thoroughly as possible, running it off from the mop into the water, and changing the water for cleaner very often. If you put much water upon a very dusty floor, you have a big troublesome mud-puddle to mop up or rinse away. Experiment has convinced me that a floor of pine or basswood looks best after cleaning, if a small amount of water has been put on each portion of it. Use as much water as you please on the whole floor, the more the better, if you wash and wipe only a small portion at a time, and then throw out the dirty water, and begin the next division with clean water. The sooner a soft wood floor dries, the better it looks. I have seen women work very hard to scrub a pine or basswood floor white, and the result has been quite disappointing. They would put a great deal of water upon the floor and then scrub with a broom hard and long; after this would sweep all of the dirty water out, and rinse the floor with as many waters as they could afford. When at last the well-soaked floor was dry, it was undoubtedly clean, but it looked dark and somewhat weather-beaten, in consequence of remaining wet so long. It is a question of health with me, in winter, to have a floor dry as soon as possible. A little lye in the water has an excellent effect upon floors. It may be poured directly upon decided greasy spots, but the whole floor is whitened with very little hard rubbing, if a small amount of lye is mixed with the water. Too much makes the boards yellow. How much should be used depends upon its strength. Never put lye into the water with which you wash a painted floor, else you gradually but steadily remove the paint with each cleaning. If you let an inexperienced hired girl have her own way with a painted floor, she will probably use her boiling suds upon it, and soon remove nearly all of the best paint. Clean warm water is best for painted floors. If you have a nice hard-wood floor, be thankful, especially if it be of white ash, but never let its spotlessness become dearer to your heart than the family peace. You learn by experiment how much nicer one of these hard floors looks, when washed with clean suds, than when washed with the boiling suds of Monday.

Let those who like get down upon their knees, and scrub their floors with brushes and floor-cloths—such work is not for me nor mine, and I consider it pitiful business for any one. I hear of long-handled scrubbing-brushes, and doubtless these are suitable for human beings in the work of floor-cleaning. What I most want is a cheap and easy mop wringer, for I dislike extremely to put my hand into the mopping water. Of such a wringer I have heard, but have had no experience of its merits.—*A Scrubber in Exchange.*

**LEAD TUBING WITH TIN LINING.**—The *Hanover Zeitschrift* refers to the subject of tinned lead tubes, quoting Thiem, of Regensburg, who states that his experience has led him to judge ill of them. He has found that they will resist the pressure proof, but do not stand water pressure after continued use, and therefore does not advise their employment where the water pressure is high. But in opposition to his views, it is found that when the piping has been soundly made according to contract it answers perfectly well. Faulty specimens were found either to be below the normal weight, or to have a lining less than half a millimeter thick or to have the lining unequal. In Dresden, as well as in Vienna, tinned piping is in good repute, the accidents that have happened being laid to the account of frost. In Heidelberg and other South German cities galvanized-iron piping has lately been used, and has given satisfaction. An indirect advantage of their use is found in their immunity from depredation.

**TO COUNTERACT THE DAMPNESS OF WALLS.**—The *Governeur-Blatt* (as translated by the *Politechnic Review*) gives a recipe for a solution said to prevent the action of moist atmosphere upon walls. A wall exposed to cold and moisture should be, it says, coated with a compound of three-quarters of a pound of soap dissolved in ten pounds of boiling water, care being taken in applying it to avoid the formation of bubbles. A little alcohol assists in dissolving the froth, and causes the solution to penetrate deeper into the wall. A second coating is added after twenty-four hours, composed of a solution of sulphate of alumina, about half a pound in 30 pounds of water. The coating obtained is, it is added, impermeable. If the first coat is not dry and hard in twenty-four hours it must be left a longer time. The action relied upon here is the formation of an insoluble alumina soap.

Oxygen and hydrogen explode by the electric spark when mixed with five times their bulk of steam. A mixture of air and carburetted hydrogen requires a third of steam to prevent its inflammation.

**Gun Cotton.**—The following instructions have lately been issued for dressing compressed gun cotton:—(1) When time permits, the simplest way of drying gun cotton is to expose it to the air of a dry room until it ceases to lose weight, or to place it in the open air during dry weather in situations where it will be exposed to sun or wind. With a dry atmosphere gun cotton may be dried by exposure to open air, even without sun, in about five days. (2) When it is desired to dry gun cotton quickly steam heat should be used, and a special apparatus has been constructed for use in the hotel and at stations for carrying out this operation safely and expeditiously. This apparatus consists of a boiler and a drying-chamber, which are placed, when required for use, with an interval of about 6 feet between them, and are connected by means of an india-rubber tube.

**THE TRADE IN HUMAN HAIR.**—The trade in human hair continues to increase at Marsella, and has now become a staple article of commerce in that city. Six or seven years ago the annual quantity imported did not exceed 16 tons, but it had increased in 1873 to 50, in 1875 to 90, and in 1876 to 92 tons. Formerly all the hair imported into Marsella came from Italy, but that country has been unable to meet the increasing demand, and a brisk trade has been opened with the extreme East. Thus, of the 92 tons imported last year, 43 came from Italy, while China supplied 26, Turkey 5, and Japan 3 tons, the remainder being made up of importations from Egypt, India, Germany, Belgium, Spain and Algeria. The total quantity of hair imported into France last year is estimated at 122 tons, value \$800,000, so that Marsella, with 92 tons, has three-fourths of the trade in her own hands.

**ASPARAGUS PAPER.**—A man of science, writing to the *Patrie*, explains what is the principal use to which the bundles of white stalks of asparagus, from which the tips have been bitten, may be put. They may be made into paper, and that not ordinary brown paper, or even book-paper, but better paper of the finest description. It appears that in a few favored places there are manufactories where the asparagus ends are used in this way, and where the careful housekeeper boards up the scraps with a diligence unknown elsewhere. But the work of collecting them is an up-hill task as yet, and it will be years before, in the natural order of things, the practice of saving them and packing them off to such factories for sale is at all generally adopted.

## GOOD HEALTH.

## Danger in Self Dosing.

There is a host of people who seem to have little else to do but to consider their physical condition and to administer doses for its improvement; people who are positively dissipated and intemperate in their use of medicines, and appear to think this world not so much a vale of tears as a vale of drugs; people to whom a new prescription affords a delight only equalled by that which a servant would experience from the possession of a bone of the extinct megatherium.

If they are in the least under the weather it never comes to them to allow Nature to work out her own salvation, but they take her affairs into their own hands, and having small acquaintance with her processes, the result resembles that of a novice attempting the tasks of a superior, and making them more difficult for that superior to accomplish. One of the peculiar pleasures of such persons consists in persuading others to try their methods of cure. The most delicate compliment you can pay them is to swallow some nauseating mixture upon their recommendation, which all the while bears a strong family likeness to that of those who, with bad conceptions, assure you that soap is wholesome for the skin, or of bald people who extol the virtues of certain washes they have employed.

This art of dosing does not interfere, however, with the usefulness of the family physician, but rather supplies him with practice by laying the foundation for positive disease. The stomach, which has been unwittingly converted into a length; the nerves that have been too often artificially another finally refuse to acknowledge the power of the charmer; the strength engendered by stimulants proves but a broken reed; appetite fortified by frequent tonics surrenders some day without reserve.

If the science of medicine itself is as yet only experimental, must not amateur dosing, beyond question, belong to the most objectionable class of empiricism?—*Dr. Holbrook.*

**LONGEVITY OF THE ISRAELITES.**—Dr. R. W. Richardson, of London, has recently investigated this subject. The result of his research has shown that, both on the continent and in England, Jews possess a higher vitality than do the general community by whom they are surrounded. Tracing the causes for this greater longevity, he says he cannot attach too much importance to the sanitary laws that obtain among the Jews, instancing those in regard to diet, cleanliness and abstinence from strong drink. In fact, the Decalogue from beginning to end is one sanitary lesson, teaching them to subdue the passions which torment the brain and distress the body.

## Danger in Vinegar.

There are more kinds of so-called vinegar in the market than brands of family flour. The *New York Tribune* thus alludes to one of the. The Board of Health of the District of Columbia has condemned five car loads of vinegar sent there from Chicago, on the ground that it is not a genuine article, and is injurious to health. An analysis of the so-called vinegar has been made. It appears, according to the report of the Board of Health, that the vinegar contains 54.54-100 grains per gallon of anhydrous sulphuric acid, combined with lime to form a sulphate of lime equivalent to 117.26-100 grains of gypsum per gallon, and besides that, five grains of free sulphuric acid per gallon. The Board also report that this sample was taken from an invoice of more than 1,000 barrels brought there to be sold as vinegar, and that it is likely to find a ready sale on account of its low price. The report concludes as follows: "When we think that oil of vitrol sulphuric acid can be bought at five cents per pound, and that a pound of such acid would render a barrel of fluid as acid as the strongest vinegar, the wonder will cease that it is so cheap. This, therefore, is a fraud upon consumers, and a dangerous mistake for vinegar. The fraud and danger are more general than the great mass of people will readily believe. It is asserted that probably one-half the vinegar sold at city groceries is a rank poison, with either sulphuric or other objectionable acids for its base, from which the acetic principle is evolved, the same as in the manufacture of acetic vinegar or the acetates used in calico printing. Acetic acid is present in all vinegars, although they seldom contain more than five per cent. of the absolute acid. Their color, flavor and value depend materially upon the ingredients from which they are made. In England, honest vinegars are usually made of malt; in France, of grapes; in Germany, of grapes, beetroots or potatoes; in this country, of apples and grapes.

## Wedding Journeys.

When a young man and woman marry, they generally think they must take a wedding trip, of greater or less extent, according to their purse, as long or short. The idea is well enough in its place, if carried out in accordance with the laws of hygiene; but this is not always the case. We have just received a notice of the death of a friend, a beautiful and noble young lady. The cause was a cold caught on her wedding tour. Such cases are not rare; but even when death does not result, injuries which last for life may be received. It would be far better to give up the wedding trip than to injure the constitution by it. There is never a time more unsuitable to journey than just after marriage. The feelings are then at their highest pitch, and they adventure the fact by every look and movement, so that they are recognized wherever they go as a newly married couple. There ought to be a reform in this matter of wedding tours. Physiologists and hygienists should set the example. Let them be conducted strictly in accordance with the laws of hygiene, or given up altogether. It is said that the daughter of Dr. Hammond, recently married to an Italian marquis, has set a good example in this respect. The father, an eminent physician, stamped the idea of a wedding journey as something barbarous and unphysiological, and so, after the marriage, by his advice, the couple were left to spend at their own home. If this is so it is an example well worth imitating. At any rate, let no newly married couple violate every physiological law by a wedding journey that may injure the health past all recovery.—*Harold of Health.*

**A SCOURGE.**—A scurf in man is called *fourder* in a horse, and is over-eating, eating more than the stomach can possibly convert into beneficial food. Wise men and careful men will sometimes inadvertently eat too much, known by a feeling of fullness, or nausea, or a discomfort which pervades the whole man. Under such circumstances, we want to do something for relief; some eat a pickle, others swallow a little vinegar, a large number drink brandy. We have swallowed too much, the system is oppressed, and nature rebels, instant comes to the rescue and takes away all appetite, to prevent our adding to the burden by a morsel or a drop. The very safest, surest, and least hurtful remedy, is to walk briskly in the open air, rain or shine, sun, hail, or hurricane, until there is a very slight sudor on the skin, then regulate the diet, so as to keep the perspiration at that point until nature relief is afforded, indicated by a general abatement of the discomfort; but as a violence has been offered to the stomach, and it has been weakened with the extra burden imposed upon it, the next regular meal should be omitted altogether. Such a course will prevent many a sick hour, many a cramp, colic, many a fatal diarrhoea.—*Health Journal.*

**TO AVOID SLEEPINESS.**—If you wish to sleep well, eat sparingly of late supper. A void all arguments or overcasted subjects after night, as these are likely to have a bad effect upon one who is troubled with sleeplessness at night. Avoid having too much company. Many persons become so excited with the meeting of friends that sleep departs for a time. There is probably nothing better, after enjoying a tranquil mind, than exercise in the open air. By observing these simple rules, sleeplessness, in the majority of instances, may be cured.



# MINING AND SCIENTIFIC PRESS

W. B. EWER.....SENIOR EDITOR.

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Write for the MINING AND SCIENTIFIC PRESS. We invite not only professional men, but practical miners and mechanics to contribute to our columns. All communications will be kindly treated. Authors, as well as readers, will be benefited by corresponding.

Address all letters to the firm, and not to individual members, or others, who may at any time be absent.

Our latest forms go to press on Thursday evening.

SAN FRANCISCO:

Saturday Morning, July 7, 1877.

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## The Week.

The week just passed has been occupied pretty fully by preparations for the Fourth of July all over the country. For the few days preceding our National holiday and a day or two succeeding it, work is partially suspended, and when it comes in the middle of the week, as it did this time, the week is pretty well broken up. The celebration in the city was a success, and great crowds of people witnessed the procession, the regattas, etc. Our citizens having now demonstrated their patriotism by observing the day, are ready again to settle down to every-day business.

There were no fireworks in the city, but at Badger's Park, Oakland, where a varied entertainment was given for the benefit of the Oakland Free Reading Rooms, they had a display of fireworks which was witnessed by a large crowd of people. A noticeable feature of the celebration was the attention paid to the literary exercises.

The MINING AND SCIENTIFIC PRESS this week commences its 25th volume under favorable auspices. We hope to continue to keep all our old readers and add many more to the list before the year ends. We shall endeavor to keep the PRESS up to the standard of a first-class mining, scientific, and mechanical journal, and continue to devote it specially to the interests of the industrial classes on the Pacific coast. We begin the volume with energy and confidence, and assure our readers that we will do all we can to further their interests by furnishing a readable and valuable paper.

## The Silver Mud Springs of Oregon.

Some months since an article went the rounds of the press relative to the discovery of certain mud springs in Wasco county, Oregon, the mud from which assayed all the way from \$300 to \$12,000 per ton in silver. There were said to be a number of boiling springs which were continually throwing to the surface a mushy substance resembling soap and strongly impregnated with alkali, in which pure chloride of silver was found in large quantities. Specimens of this curious substance were sent to Professor Silliman, at New Haven, who made an analysis and sent us the results, which we published in our issue of December 16th, 1876. He pronounced the whole thing a fraud, stating that the mud was salted. He found no silver chloride at all, but found the silver in the pulp in a metallic state. He explained in this letter how he detected the thing, and said that any miner could at once solve the riddle by washing a small particle of the stuff free of slimes, and rubbing down the heavy grains in an agate mortar, or between two slips of glass, when the brilliant grains of polished metallic silver will at once appear as thin scales.

In our last issue we gave an article read before the Geological Society on this subject by Henry G. Hanks, and also a letter from Richard Hurley making a statement concerning the occurrence of the springs. Mr. Hanks in his paper doubts their being an artificial production, as his investigations lead him to suppose the product natural, for reasons expressed in his paper.

The *Mining-Immigration Journal*, a paper published in Portland, Oregon, has had a good deal to say recently of this "silver mud," but does not believe in the existence of any silver in the mud. On investigation the reports published from that section were found incorrect. The *Journal* says: We have had specimens of the mud brought directly to us, taken from a depth in some instances of 27 feet, from "soap" holes, the mud from which was reported to have assayed from \$4 to \$800 to the ton, tested thoroughly and not a trace of anything valuable could be discovered; quartz, some of it from the celebrated strike said to have been made by some Alhany "boys," was also tested with the same result. Moreover, we are informed that no quartz ledges whatever exist in that locality; the quartz being what is called "float" quartz, which can be found in almost any locality in the State. The reports are so entirely different from what we were led to suppose, that we have no hesitation in saying, we at least are thoroughly convinced, that there is no merit whatever in the so-called "silver springs." We also believe the management of these mines has been, to say the least, imprudent. We can imagine no good reason why it would not have been practicable to have made a large shipment of this mud in barrels or otherwise, either to Portland or San Francisco, for amalgamation and treatment, thus thoroughly testing its value, before going to the expense of purchasing and shipping machinery to the ground. Even if there was silver in the mud the extractions so far reported made, have been from such minute quantities that as a mere matter of precaution it would seem such action on the part of the directors would be more satisfactory and business like. The detriment to the interests of Oregon of ill-advised mining excitements is our sole reason for stating these—what we consider—facts.

The *Journal* states that disinterested persons of experience who have visited the district say there are no quartz ledges there. It says in another article: The mud which we have tested, was taken from "soap holes," that had assayed according to report circulated, from \$4 to \$800 to the ton; the test made here for us showed that it contained nothing whatever, and it also seems from the card mentioned that other tests made of mud lately brought down, only yielded silver after repeated assays; that is to say, several assays had to be made before any mud was found which had anything valuable; we are told that only one assay out of five of these showed silver, and in reference to this, we have heard—but it is merely hearsay evidence—that the yield amounted to one dollar and forty cents per ton.

**BULLION SHIPMENTS.**—Since our last issue shipments of bullion from prominent mines have been as follows: Modoc, June 26th, 235 bars, value \$3,900.71—total to date, \$48,453.67; California, 27th, \$187,872.94; Con. Virginia, 27th, \$155,672.78; Northern Belle, 26th, \$9,791.47; Tyho Con., 26th, \$8,753.22—total to date, \$88,838.91; Grand Prize, 29th, \$8,000; Chollar—total for June, \$34,626; Northern Belle, July 1st, \$15,123; Arizona, July 1st, \$3,274; Indian Queen, June 27th, \$1,114; California, July 3d, \$405,847—total to date, \$1,567,930; Grand Prize, July 3d, \$8,000; Leopard, July 2d, \$6,700; Ophir, July 1st, \$9,176; Leeds, July 4th, \$4,583; Con. Virginia, July 3d, \$263,911—total to date, \$867,827; New Coso, July 2d, \$6,864—total for June, \$70,064.

It has been reported for the past 30 days that the miners working at the bottom of the combination shaft, in Virginia City, could hear the blasts set off in the header of the Suto tunnel. For the last few days the blasts in the combination shaft are distinctly heard by the miners in the Suto tunnel, which is conclusive evidence that the latter is rapidly approaching completion.

## Pavement of Sluices.

In the issue of the MINING AND SCIENTIFIC PRESS of June 16th we published an article on this subject, illustrated by sections of rock and wood pavement. A correspondent from Calaveras county, signing himself "F. S.," referring to the article, sends us also his experience with pavements, which we give as follows:

Block pavement is generally discarded by those who know better, excepting in places where but little grade can be had or suitable paving rocks are not convenient. Blocks are generally sawed from logs of a trifle larger diameter than the width of the flume and then trimmed to fit. Such blocks give triangular riffles at the sides, save labor in construction, and cannot be displaced by vibration when the side lining is added.

The rock pavement, as represented in your illustration, would be rather difficult to obtain, as the rocks would have to be of uniform length. Hard, smooth cobbles of an oblong shape, from eight to eighteen inches in length, make a superior pavement in all respects where sufficient grade can be had. Begin at the lower end of the flume, lap the most suitable end of each rock on the row below it, say from two to four inches, being careful that the crests of the overlapping ends are as near as possible of uniform height. When the paving is completed add the side lining as usual, then chink up with wood or rock the spaces which may be between the lower edge of the lining and the crest of the rock under it. Now turn on water sufficient only to carry sand and small pebbles, taking care that the sand fills completely all interstices in the pavement. Then allow, gradually, larger pebbles and more water to pass through the flume. If properly done, not a single paving stone can be dislodged even by good sized rocks driven by a large head of water. Such pavement can be used in a flume of any desired width, is cheaper and superior in attritive action, and gives a larger gold-saving area than all other pavings for like purposes. It was used successfully in Sierra county seventeen years ago.

In 1855 I used cast iron riffles two feet in length, as wide as my flume, in shape similar to a common wash board, with rim at ends and sides as high as the bars. They were excellent and very convenient gold-savers, but not adapted for general use.

## Closing Down of a Famous Mine.

The old Eureka mine, at Grass Valley, which has made such a splendid record for itself as a bullion producer and dividend payer, for a long period of years, has been closed down permanently, showing that all things, no matter how good, must have an end. The mine has been famous, not only for its profitable working, but for the good and honest management under which it has been conducted. Mr. Wm. Watt has been the Superintendent for the past twelve years.

According to the last annual report, the receipts and disbursements of the company, from the date of its going into operation, October 1st, 1865, to September 30th, 1876, were as follows: The total receipts were \$4,528,254; the dividends paid were \$2,094,000; milling and mining expenses, \$1,923,812. The *Union*, in speaking of the mine, says:

"A month or more ago a dividend of \$40,000 was declared, making a total of \$2,094,000 paid out for dividends by this company. The amount taken out of the mine must be something over \$5,000,000. The Idaho, which adjoins the Eureka on the east, has taken out almost as much, and is still paying magnificently, having pay ore in the lowest depth yet attained—1,900 feet. The two mines, as far as worked, have furnished to the world about \$9,000,000 worth of gold.

"The Eureka worked out the pay chute at about the depth of 700 feet. The pay went into the Idaho company's ground, and shows every sign of going down to an indefinite depth.

"The Eureka has never levied an assessment, and its last act will be to declare a dividend. This dividend will be in the neighborhood of \$30,000. Old Ajax will quit business in a hushy way, and will leave a record of faithful and efficient management, of which all Grass Valley is proud."

A short history of the famous property will be interesting. We copy it from "Beans Directory of Nevada." "Eureka hill, through which the Eureka vein runs, is about one mile and one-quarter from Grass Valley. It was originally known as Eureka mountain, the first location being made February 7th, 1851. The Eureka, which, as far as developed, has proved itself the richest gold mine in the world, is among the earliest quartz locations in the township, but its richness, notwithstanding it had been worked by various parties for a number of years, was not fully developed until the winter of 1863. The mine was owned at various times by D. L. Lamarque, Geo. D. Roberts and William Chollar, who failed to find it profitable; Lamarque, who had purchased the interests of the other partners, finally selling the mine in 1857 to Fricot, Ripert & Pralus, for a comparatively small sum. During the years from 1857 to 1863, the ledge was worked to a perpendicular depth of 48 feet, and during this period large quantities of quartz were taken out, none

of which paid largely, while the greater portion of the rock failed to pay crushing expenses. Becoming satisfied at last that the ledge was really a good one, Fricot & Co. commenced sinking a vertical shaft in 1863, completing it to a depth of 100 feet in 1864. The vein at this depth was very large and well defined, showing an excellent quality of quartz. The company in sinking this shaft took out sufficient money to pay the expenses of erecting hoisting works, building the present magnificent mill, all at an expense of over \$60,000, besides giving numerous handsome dividends to the three partners. From 1863, up to the sale of the mine in the fall of 1865, the Eureka continued to pay largely, but the figures we have not been able to obtain."

## Cost of Production at the Mount Diablo Coal Mines.

The only coal field in the State of California which has hitherto been profitably mined, is the Mount Diablo coal field, now, however, nearly worked out. The mines in this field have, according to Mr. Goodyear, in his "Coal mines of the Western Coast," yielded since 1861, a total of 1,875,962 tons of coal, of 2,240 pounds to the ton. These mines are the principal ones in the State, as although it is easy to find coal in many localities on the Coast range, from one end of California to the other, as well as at certain points in the western foothills of the Sierra Nevada, yet it generally happens either that its quality is poor or its quantity small, or else that it is situated in the heart of the mountains, so far from market that the cost of transportation alone would far exceed the value of the coal.

Concerning the cost of production at the Mount Diablo mines, Mr. Goodyear, whose work we noticed last week, has had excellent opportunities of observing, and the following extract will be found of value to those interested in this kind of mining:

"The cost of mining and transporting the Mount Diablo coal has varied very greatly, not only between the different mines, but also at different times and under varying circumstances for the same mine. The differences in this respect have been so great, indeed, that any single statement of the actual cost for any particular mine at any definite time would be of no value whatever as an index of the cost at the same time for a different mine, or for the same mine at a different time. This fact is well illustrated by the history of the Black Diamond Coal Company. At their mines, the monthly averages of the cost per ton for labor alone in mining the coal and putting it into bunkers at the mines, exclusive of the cost of timber and all other supplies, have ranged at different times since 1867 from a minimum of about \$2.37½ to a maximum of very nearly \$4; or say, including supplies, from about \$2.75 to \$4.50, or a little more, per ton. Within the same time, the monthly averages of the cost of the railroad transportation from the mines to the landing have ranged from 25 or 30 cents to over \$1.00 per ton; while the cost also of the water transportation from the landing to San Francisco has varied between 37 cents and \$1.25 per ton.

"But then, again, these three items of cost for mining, for land transportation, and for water transportation, have rarely or never reached either their maxima or their minima values simultaneously, and consequently the actual highest or lowest figures of total cost for mining, transportation and delivery of the Mount Diablo coal at any particular time would not be obtained by adding together separately either the highest or the lowest of the figures given above.

"This total cost, however, has varied at different times since 1866, from a minimum of about \$5.00, or possibly a little less, to a maximum of somewhere between \$6.50 and \$7.00 per ton. But for a general estimate of the total average cost of all the Mount Diablo coal which has ever been sent to market, the sum of \$5.75 per ton may be taken as a fair approximation.

"It may also be stated in this connection, that the average loss of coal in the pillars and in waste of one kind and another in the working of the mines has been, as nearly as it can be estimated, not far from 25 per cent. In other words, only about three-fourths of the coal which the beds contained has been extracted and utilized throughout the whole extent of the works."

**PIOCHE.**—In Salt Lake City, San Francisco district, Leeds, Silver Reef, and all the outside districts, the impression prevails that things have commenced booming in Pioche, similar to the way they did in 1871, and individuals from every direction are making their way to Pioche as fast as possible in all manner of style, the roads leading to that place having plenty of men making the trip afoot. The *Record* cannot say what has given this impression, but it is a very false one, and some will bitterly regret leaving good positions to go there at present. Although the camp is doing very well there is nothing to justify a high rush nor the chance for men to get work by going, so they had better hold off for a while.

The Sulphur Banks quicksilver mine is turning out from 1,000 to 1,100 flasks of quicksilver per month. The company intend refining sulphur again, the demand having increased.



## The Twelfth Industrial Exhibition.

We give herewith an engraving of the medal to be awarded to exhibitors at the coming exhibition. This medal was designed by Messrs. Mayers & Stott, jewelers in this city, and is handsome and appropriate. Trade and commerce, art and science are effectively symbolized on the obverse. A female figure, crowned by accessories indicative of the Golden State, is represented as bestowing a laurel wreath on a kneeling mechanic. Her left arm rests on a shield, bearing the arms of the city, and in her left hand is the caduceus of Mercury. Her head-dress is that of a Bacchante, and at her feet are the offerings of Pomona. A manufactory with smoking chimneys, a locomotive, a Corinthian column, an anvil, an atlas, a plow, a toothed wheel, a sheaf of grain, and a few open books fill up the space around the figures. In the background is the Golden Gate, through which a merchantman, indicative of commerce, is passing. Above is the Star of Empire, and a bear's head is introduced beneath the general design, to typify the State of California. The reverse of the medal contains a wreath with suitable lettering. This medal is very handsome, as any one can see by the engraving, and reflects credit on the taste of the designers. Mr. Stott, an experienced and skillful engraver, is now at work on the die. These medals will be struck off by the designers, and will be in bronze. Probably a few will be made in gold and silver. This medal is probably the largest one ever struck off in the United States, being of the size of our engraving, a little over three inches in diameter.

Active measures are being taken by the Board of Managers to make the Twelfth Industrial Exhibition under the auspices of the Mechanics' Institute, which opens on the 7th of August, a perfect success in every particular. Already more applications for space have been received than ever before at so early a date, showing that the exhibitors are anxious to co-operated heartily with the managers and make the exhibition a success.

The building in which this fair is held is the largest one on the coast, and is the same in which the last one was held. The building is 200 feet wide, 550 feet long, and 100 feet high with a gallery around the inside, beside a promenade sixteen feet wide and 1,000 feet in length, from which an obstructed view of the interior is obtained. In addition to the above space there is an exotic garden, 70 by 200 feet, for the display of the fruits and flowers of the coast—a department which is specially attractive to the ladies, and which is always a specially pleasant feature of these exhibitions. The mechanical annex, for the display of special machinery, is 50 by 200 feet. The main line of shafting is 500 feet in length, with sufficient pulleys for all requirements. This art gallery is 400 feet long and 50 feet wide, well lighted by skylights during the day and by the most improved reflectors at night. This department is also always made very attractive, and forms a complete exhibition by itself. Over 6,000 gas lights are used to illuminate the building during the evening. The musical feature of these exhibitions is excellent, as a grand instrumental concert is given each afternoon and evening by a selected orchestra under the leadership of an experienced director. A large and powerful engine will furnish the motive power for all machinery required to be in motion, while steam and water will be supplied in ample quantities to such machines and appliances as require them.

The importance of these exhibitions to San Francisco and this coast can scarcely be calculated. They arrest the attention of adjacent nations and visitors therefrom and open new avenues of trade and industrial commerce. There can be no better way for a manufacturer to place himself before the public than by means of these exhibitions, as there the buyers have an opportunity to examine in person the articles of manufacture which they are likely to want. Many practical benefits accrue, not only to citizens of this and adjoining States, but to the world of science, industry and art. Every new manufacturing industry established here is of direct value in dollars and cents to the Pacific coast, and these exhibitions give such manufacturers the best possible opportunity to show the people exactly what can be done here and call their attention to the fact that particular articles are manufactured among us. The large and continued attendance at these exhibitions of all classes of our citizens, and the interest manifested in the display, gives the exhibitors assurance of good audiences while the fair is open; and the promptness with which applications for space have come forward show that this important point is duly appreciated by our manufacturers.

Last year no prizes or premiums were awarded to any class of exhibits; this year the managers have concluded to offer a liberal list, for the first order of merit only, on articles in the respective classes. No second-class premiums will be given, and each article must stand on its own merit. It will be understood that while one class may be considered inferior in merit to another class, yet the awards will be for the best in that class to which the article receiving the award belongs. Elaborate experimental tests will be made whenever practicable, and the result embodied in a formal report. In cases where cash constitutes the premium, as in the horticultural department, the awards will vary in accordance with the value of the exhibit.

## Compound Mining Pump.

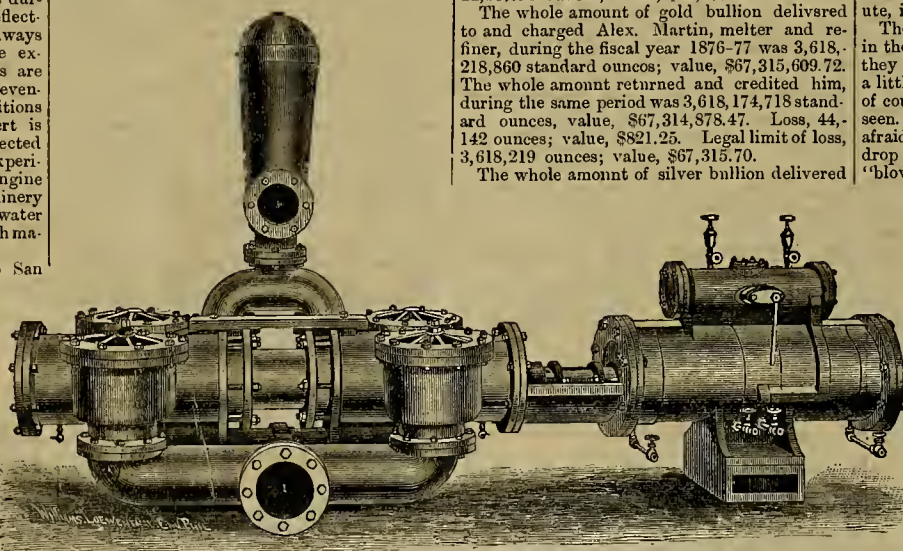
The engraving on this page shows a compound double plunger pump, devised for mining purposes, now being introduced by Parke & Lacy, 417 Market street, in this city. The peculiarity of this pump consists in the double plunger instead of single, so as to be more in proportion for a large compound steam pump. It is intended for heavy work and will handle very dirty water from mines, being manufactured with this in view. The pump is double acting in each cylinder.

We have described the Walker compound steam pump, but this is a different style from those heretofore mentioned. It is claimed that this pump is very economical and durable, and specially adapted for deep mines. Mr. J. Haug, mechanical engineer, in a recent article in the *Polytechnic Review*, has a detailed comparison



MECHANICS' INSTITUTE MEDAL FOR 1877.

of the results of work accomplished by a 7½-inch single cylinder, and 12-inch compound pump, which is summed up as follows: Steam used in cylinder of compound pump, 420 cubic inches; steam used in valve, 159 cubic inches; total, 479 cubic inches. Steam used in cylinder of single cylinder, 730 cubic inches; steam used in valve, 40 cubic inches; total, 770 inches. The single cylinder pump thus shows an in-



COMPOUND DOUBLE PLUNGER PUMP FOR MINES.

crease of consumption of 770—479=291 cubic inches, or 60.75 per cent. over the compound.

**THE NOBLE MINE.**—From a private letter we obtain the following information concerning the Noble mine, near Sheridan, Montana, some time since mentioned by our correspondent, while traveling in the Territory. They have found the pay shute, and have just commenced running the quartz through the mill. It looks well on the plates. It looks as if the ore would pay from \$40 to \$50 per ton. The ledge is from one and a half to three feet thick. The owners have taken quartz, in which no gold was visible, and pounded it up and obtained 45 cents from less than a pound. The owners think that they have a permanent lead, and a valuable one. Capt. Means's mine, in the same vicinity, is looking well. The last run cleaned up over \$50 per ton.

The Russian government having ordered the purchase of 30,000 horses, Germany will issue a decree prohibiting the export of horses from that empire. It is semi-officially stated that this measure will be solely on the ground of internal economy, and not for political reasons.

## Close Work With Bullion.

It is well understood that in melting and refining gold and silver bullion in the process of coining at the mints, there is usually considerable loss incident to the handling in the different processes. The percentage of loss is pretty well known, and the Government allows a legal limit for such loss. Of course the officials, if honest and capable, can come within this limit, but the closeness with which the work has been done this year at the branch mint in this city, according to a statement furnished by the Government officials, is somewhat remarkable. The figures speak for themselves.

The whole amount of gold bullion delivered to and charged Frank J. Cicott, coiner, during the fiscal year 1876-77 was as follows: Standard ounces, 3,497,968,690; value, \$65,078,487.28. The whole amount returned and credited him during the same period is 3,497,884,595 ounces; value, \$65,076,178.52. Loss, 124,095 ounces;

value, \$2,308.76. Legal limit of loss, 1,748,984 ounces; value, \$32,539.23.

The whole amount of silver bullion delivered to and charged him during the same period is 22,567,231.55 standard ounces; value, \$28,077,426.50. The whole amount returned and credited him during the same period is 22,562,056.21 ounces; value, \$28,070,987.51. Loss, 5,175.34 ounces; value, \$6,438.99. Legal limit of loss 22,567.23 ounces; value, \$28,077.42.

The whole amount of gold bullion delivered to and charged Alex. Martin, melter and refiner, during the fiscal year 1876-77 was 3,618,218,860 standard ounces; value, \$67,315,609.72. The whole amount returned and credited him, during the same period was 3,618,174,718 standard ounces; value, \$67,314,878.47. Loss, 44,142 ounces; value, \$821.25. Legal limit of loss, 3,618,219 ounces; value, \$67,315.70.

The whole amount of silver bullion delivered

to and charged him during the same period as above was 23,635,113.9 standard ounces; value, \$29,407,295.68. The whole amount returned and credited him during the same period was 23,631,673.08 ounces; value, \$29,401,770.55. Loss, 4,440.82 ounces; value, \$3,525.13; Legal limit of loss, 35,454.17 ounces; value, \$44,110.94.

At North Bloomfield three monitor nozzles, each eight inches in diameter, in a single mining claim, throw 30,000,000 gallons of water against gravel cliffs—twice as much water as the whole city of San Francisco uses. The yield of gold for each day is \$1,500, and the labor costs \$140. The gravel is 350 feet deep, and for 340 feet from the surface contains three and one-half cents of gold per ton on an average, and for the 10 feet next the bedrock \$10 per ton.

**SILVER KING** is a newly formed district in Lincoln county, Nev., about 25 miles from Cave valley, in which Ph. Felsenthal, John Hughes, and J. V. Keeley are interested. Ore was brought to Pioche from there and assayed, going \$323.61 per ton.

## Playing Miner with Success.

Gold has been found in the mines by accidents of all kinds, and some curious stories have been told of the trivial occurrences which have led to the discovery of the precious metal. A very curious instance of the kind is told by a correspondent of the *Bedrock Democrat* as having occurred at Auburn, in that State, as follows: Another discovery of vast importance has lately been made by Mr. Wm. Graham. It seems that some weeks ago Mr. Graham concluded to teach his little son habits of industry by inducing him to play minis. He accordingly outfitted him with a pick, pan and shovel, and then very gravely laid off a claim across the street from his store so as to be convenient for observation, then set the little fellow to work, meanwhile instructing him in the most approved methods of mining. The boy worked for a day or two, when his father pronounced the claim fairly opened, and furnished the juvenile miner with a miniature set of sluices and diverted a few inches of waste water into them.

Under these favorable circumstances the boy continued his mining operations for a short time, and finally brought in about 75 cents, worth of gold dust as the result of his first clean-up. This excited the interest of Mr. Graham to such an extent that he volunteered his assistance in working the claim, and the prospects continuing so favorable, he employed men, put on hydraulic and commenced prospecting in earnest. The result of which has been to prove, beyond a doubt, that there is a deep river channel underlying the entire length of the town of Auburn. The gravel is of considerable depth, and yields gold in paying quantities from the top down.

As a matter of course, when this became known all the available ground on this discovery was speedily taken up, which, when properly developed, will afford employment for 100 men or more for the next 10 years.

## Strikes.

Several very rich strikes have been made this summer in the mining counties, where very large amounts of money were taken out in a few days. Although this sounds like the "days of '49" to hear of fortunes being realized in a few days, and does not often happen in the mines now, still occasional strikes are made. The principal ones which have attracted attention are those of "Pike" Bell in Placer county, and Reese, Grant and others in Nevada county. Bell, after being "flat broke" until matters could be no worse, struck out on a prospect and found his fortune. He has taken out upwards of \$30,000 from the little hole he had sunk, and although the prospect might give out any minute, it had not given out at last accounts.

The last strike is that of Reese, Grant & Co., in the "Gongs" mine, Nevada county, where they have taken out over \$10,000 in gold from a little seven-foot shaft. This is also a pocket of course, but how deep a pocket remains to be seen. Usually in such cases the owners are afraid to sink very far for fear the bottom will drop out or the quartz turn poor. These "blow-outs" are few and far between, but when they are found, they are rich enough to make up for their scarcity. The *Foothill Tidings* says the discovery of this mine carries a lesson to prospectors. Within 30 feet of this rich deposit on the same quartz vein, a shaft was sunk some 10 or 12 years ago by J. T. Butler and others and abandoned because no gold was found. Three or four years ago one Muchmore found a piece of "float" rock within six or eight feet of this shute and sunk a small shaft on the ledge. There are several other little holes around there, but none of them evidently found gold on the ledge. Reese, Early and Grant did not sink alone at the spot they found the float, but followed on in the direction the float was likely to come from—up hill—and were rewarded with pay shute which is likely to make the fortune of them all. Mem.—Because one spot on a quartz lode is barren, or a dozen or a hundred spots, it is no sign there is not a bonanza in it. "There is a vein for silver and a place for gold, where they find it."

The blockade of boats on the Chesapeake and Ohio canal has assumed such proportions that on Saturday the Sheriff of Washington county, Md., accompanied by the State Attorney, went to Hancock and broke it up. A blockading squadron, composed of from 30 to 40 boats, was anchored abreast to prevent other boats passing, delaying about 200 boats. The blockade was caused by strikers striving to prevent boats working for less than one dollar per ton for carrying coal from Cumberland to tide water.

**MONTANA MINES.**—Our traveling correspondent, who recently returned from a trip through Idaho, Montana, Nevada, and California, says he found that there were as many mines paying a profit in Montana as in any other region visited. In other localities there were more mines being worked, but in proportion to the number worked, Montana was ahead.

The reduction of interest charge on the public debt since July 1st, 1876, is \$1,943,625, which is the result of the funding operation.



## Pluck Rewarded by Luck.

The Placer Herald has the following account of the way a fortune was made in three days: The richest strike made in this county for many years, and as rich perhaps as was ever made, we have the pleasure of recording. A. O. Bell, commonly called Pike Bell, who with his family has resided for many years on Bald hill, a few miles north of Auburn, as many know, is a dauntless prospector. Though occasionally making a strike of some considerable importance in the past, he has managed, like most modern prospectors, to keep poor. Last winter, in particular, he was in very straitened circumstances; having no money and the merchants refusing to credit him, he offered his horse, worth about \$50, for \$10, that he might buy bread for his children, and failing in his efforts to sacrifice his horse, he pawned the ring off his wife's finger to obtain the necessities of life. Under such circumstances many would have given up prospecting and gone at something that promised more certain results. Not so, however, with Pike. Day by day he continued his researches for the glittering treasure, and whether the passing day had revealed a color or not his spirits were always jubilant, apparently kept up by the hope, that seemed never to desert him, of doing better on the morrow. At last the lucky day came. It was about three weeks ago, when hunting around over the hills, he struck his pick into a little mound which resembled somewhat in appearance an ant-hill, and to his delight he unearthed some pieces of decomposed quartz, attached to which were some colors of gold. Encouraged at this prospect he began to sink on his new lead and was rewarded by finding more or less gold at every stage of descent. Last Saturday he had reached a depth of about 30 feet and had taken out in sinking that far, rock estimated to be worth about \$1,500. The rock being rotten, or what is called by quartz miners decomposed, he had, with little effort, pounded out in a mortar enough to pay expenses as he progressed. The result thus far had been very good, and as the rock had got richer as he got deeper, he was of course entirely pleased at the prospect. Those he had talked to about his mine considered he had a good thing, but none ever dreamed of the great wealth that was in store for him. He had hired men to assist him in working the mine, and on last Monday morning they went to work as usual. The gouge, as we would call it, as it is too rotten to be properly called a ledge, was discovered by noon to have become suddenly richer. In the afternoon chunks of almost pure gold were taken out, and the decomposed stuff that filled the interstices between the rocks was so rich in gold that Pike began to wash it out with a pan. From three pansful washed Monday afternoon, he obtained gold estimated to be worth between \$4,000 and \$5,000. That evening he came into town, and giving us a hint of what he had got, invited us to go out and see it. On Tuesday afternoon, in company with Sheriff McCormick, we visited the mine. We found Bell with a pan of gold in his hands worth from \$1,000 to \$1,500, which he assured us all came from one pan of dirt; "hut," said he, "if you don't believe it, I will wash another pan and show you." We told him to wash. The pan was sent down in the shaft and soon returned filled with a mass of muddy, rocky stuff, that sparkled all over with pieces of gold. This was washed out, and was found to contain fully as much of the precious metal, if not more, than the one he had just finished panning when we arrived. It was really the greatest sight we ever saw, and McCormick, who mined in California in its palmiest days, says it knocked the spots off anything he ever saw, except on one particular occasion. Bell having convinced us of the richness of his mine, took us to his house to show us the proceeds of the previous days' panning, that we might be convinced of all he had told us. The sight was one more easily imagined than described. As we looked upon the pans of gold before us, we thought of Aladdin and his wonderful lamp, and wondered if the story had not been suggested by some such reality as was before us. On Wednesday evening, Mr. Bell (it is "Mr." now since he has lots of gold, it was "Pike" before) was in town again, and he informed us that what we saw was nothing; that he had taken out \$10,000 in three pans that day; that he had taken out, all told up to that time, between \$30,000 and \$35,000, and that he had an offer and was about to sell for \$20,000. When asked his notion for selling, he said he would get away with \$50,000, and that was money enough for him. To be sure, it is a good stake, and when we consider that it was made in three days, it must be confessed that the chances for making a sudden fortune in California are not all gone.

CENTRAL DISTRICT.—There appears to be a chance for Central district to assume the importance among mining camps to which its several veins of rich ore entitles it. S. E. Holcomb of San Francisco has been examining the mines there, and has entered into an agreement with the owners to purchase each and all of them with the exception of the Teamster. The owners are poor men who have been endeavoring to develop them by their own labor, and have no means except the proceeds of a few tons of ore extracted in sinking or drifting. This source of income has been partially if not wholly cut off since the Humboldt reduction works shut down.—Silver State.

## Improved Buddle.

An improved buddle recently invented by Mr. R. H. Williams, M. E., of St. Ansell, is claimed to be the simplest and most effective yet introduced. It is a fixed convex buddle, the improvement consisting in delivering the ore with the water through a revolving tube directly into a small receptacle in the center of the bed, whence it is forced over on to the buddle by the falling water and mineral, the result being an unusually even distribution of the material to be dressed. To fix the buddle a pit is sunk about 3 ft. square, and about the same depth under the intended floor-line of buddle. In the bottom of the pit some 2½ or 3 in. plank is placed. When quite level the foot of the stand is put in position on the plank and spiked down, care of course being taken that it is quite upright. The stand is then built around with masonry to support it and high as the floor line, the arm is screwed up and the center is plumbed to fit the cup. The bottom of the tube is fixed 16 in. above the top of the cup, the cup being nailed down upon a piece of wood exactly underneath the center of the tube, from which the pitch to the stand is taken, and the outer line for the floor is marked. The circumference is struck 6 ft. from the center of the cup. The outside is constructed 12 in. above the floor line, and the bottom is laid in of wood, cement, or any smooth, durable material, Roman cement being that to which preference is given, care being taken to have a perfectly conical bottom, and that the outer part is perfectly level all around. The pitch from the center to the outer extremity of the buddle on a 6-ft. run depends upon the character of the ore treated, and the work to be done. For gold, silver, lead, tin, copper, or other ores whose specific gravity allows of separation by washing, stamped through a 7, 8, or 9 grate, 10½-in. pitch; if through a 10 or 11 grate, 9-in. pitch; and if through a 12 or 13 grate, 7-in. pitch. For slimes, the first operation, a 3-in. pitch is used, and for cleaning, a 4½-in. pitch; some tin slimes require a 6-in. for cleaning. The tube must not be driven faster than 4 revolutions per minute. In the treatment of tin ores, crop tin buddle should have 10-in. pitch; skimmings, coffer, or shaking trunkwork, 9-in. The hoppers or feeders are provided with means of regularly supplying the ore in solution, and also clean water. Mr. Williams states that he is confident as to the simplicity and efficiency of the buddle, the great improvements in it over every other yet introduced being that, as it is supplied with a revolving tube, which regulates the supply of crushed ore, it is quite impossible to admit more water than is necessary to separate the ore, and consequently prevents the ore from being washed back with the tailings. The revolving tube causes the direct fall of the ore to the center of the buddle, forming a self-regulating distribution of the ore all over the conical floor. The ore to be treated being submitted to a clear stream of water, in addition to the water necessary to hold it in solution, the washing is much more effective and the separation at one operation is superior to any process before invented. This buddle is suitable for every department of separating and cleaning finely divided minerals, and is in use for separating gold, tin, lead and other ores. It is simple in construction, cheaply erected, and has no part that can decay, or that cannot in a few hours be replaced if worn or broken by accident.—London Mining Journal.

## Does Mineral King Need a Furnace?

A correspondent of the Visalia Delta says: As there is some talk of endeavoring to secure the erection of another furnace at this place, a few words concerning the demand for it may not be out of place. At present there is not a man, or body of men, in Mineral King, who can truthfully affirm that there is a mine in this whole district. Indications and croppings, and occasionally a six to 12-foot hole, with an assay of picked specimens, is the foundation on which are built the owners' air castles of future wealth and power. For aught anybody knows to the contrary, every ledge may "pinch out" at any depth below 60 feet.

The time when capitalists were willing to assume all risks attendant upon opening, prospecting and working a mine, besides paying the lucky discoverer any price demanded, is passed. Now, if a man is confident he has a good claim, he sinks a shaft to a reasonable depth, and runs a drift each way on the ledge. Then, with this showing, and fair samples of his ore on the dump, he will find little difficulty in disposing of his ore or his mine, or inducing capitalists to erect suitable reduction works. The chances are that there are some good claims here. Until sufficient ore is extracted to keep a furnace going at least two weeks, and to have enough from some claim to determine its manner of working, no serious thought of erecting another furnace ought to be entertained. A reference to the N. E. T. & Co.'s dearly bought experience in handling this ore will be sufficient proof of this. But if a man is willing to kill the 20 days of time required by law to be spent on his claim (and that, too, in working it), or to relocate from year to year, trusting that Providence will send around some one with more money than brains to whom the "honest miner" will transfer his Aladdin's cave in exchange for a round sum in double eagles, his claim will very likely remain unworked for a hundred years to come—and according to one of the "knowing ones" here, at that time they will be thoroughly "ripe."

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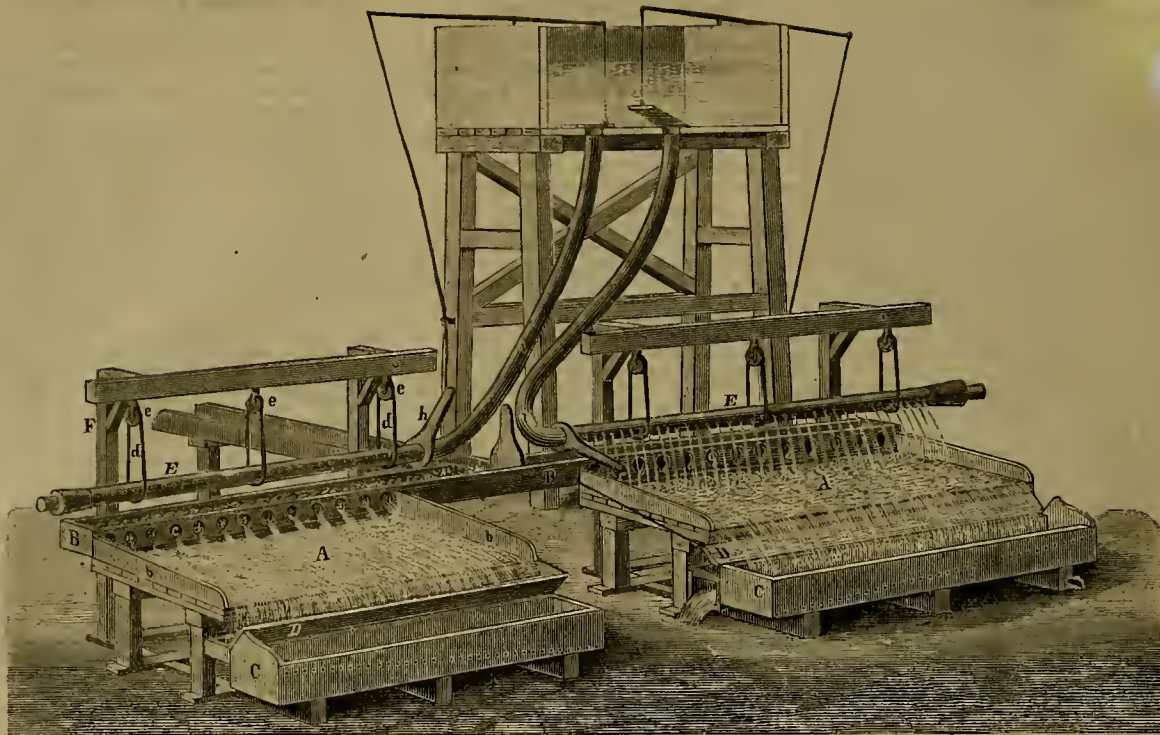
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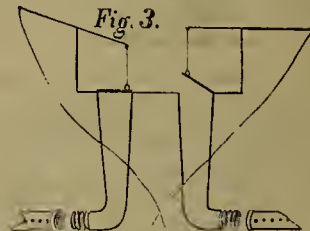
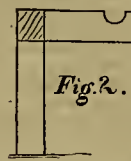
The illustration on this page represents an improvement in concentrating tables for ores recently patented through the Mining and Scientific Press Patent Agency, by J. U. Tolles, of Virginia City, Nevada, who has been using the apparatus very successfully in several places. In the engraving, A represents a flat inclined table provided with a surfacing of cloth or other suitable material of any kind, and with the ledges B, to prevent the material from passing over the ends. B represents a peculiarly constructed feed box extending along the upper edge of the table and provided in its front side with a row of discharge openings, C, of the form shown, each narrowing down to its lower end and of such a size as the nature of the material requires. C represents a receiving box or trough, extending along below the lower edge of the table. D represents a leaf or board hinged to the rear side of the trough or box C, in such a manner that it may be turned under the edge of the table to conduct the valuable material therefrom into the box, the refuse passing over the edge of the table and discharged upon the ground, or into the box in the rear of the box C. E represents a rotating tube or pipe suspended lengthwise above the upper edge of the table by endless belts F, passing over pulleys G, supported in the rigid frame H, or by brackets fastened to the frame and extending out the proper distance over the table, the tube resting and rotating upon them as shown in Fig. 2. The tube is provided from end to end with a row of perforations, and with a hand lever, I, at one end, and is connected by a hose J, to a tank, pump or reservoir, delivering water at a pressure of from eight to 12 feet of head, as the nature of the case requires.

In operating the machine the feed box is narrowed to about one inch at its further end, or has a strip of board set edgewise in the bottom, and running obliquely across the same from the rear to the front side, causing the material to gradually be brought to the front and discharged through the feed holes C, upon the table, thereby insuring an even distribution and steady flow of the material to be treated; a steady and copious supply of water is maintained in the box, and the ore sands or tailings introduced therein. The water escaping through the openings, C, flows down in a thin light stream over the face of the table. The mineral particles are deposited upon and retained by cloth or other surfacing material on the face or bed of the table, while the light refuse matter is carried over the lower edge and discharged outside of the box C. After the collection of a suitable amount of metal upon the

table, the supply of water, etc., to the feed box is stopped by the gate and turned upon the other table. Clear water is now supplied to the first pipe, K, and allowed to run down over the table, (for a moment), washing off the remaining refuse sands, and at the proper time the hinged leaf D, is drawn (by the rod) under the edge of the table, the pipe being rotated or turned and the water thrown through the perforations upon the table in a row of fine jets, forming an almost continuous sheet or film. By means of the lever H, (which should be fastened on the pipe at right angles to the line of perforations), the tube is turned and the sheet of water swept over the table from the top to the bottom so as to drive all adhering particles therefrom and wash them down into the box C. After this operation the jets are stopped from the tube, the leaf

The object in arranging the perforated pipe so that it can rotate is to permit a gradual change in the direction of the jets, so that their point of impact upon the table can be advanced from its upper to its lower edge, and thereby every portion of the surface subjected in turn to the direct impact of the jets, in order to effectually loosen and drive forward the particles therefrom.

The flow of water can be regulated by the valves operated by the cords. The gate shown in the feed trough, G, will throw the water into either feed trough as desired.



thrown back, and the gate shipped to the other feed box, the feed water coming back on the first table, the operation being repeated as often as it is seen the tables are charged with the sulphurets or other valuable metals.

By employing the proper kind of cloth, grooves, riffles, or copper plating, or all of them combined, and giving the tables the proper grade, and properly regulating the flow of water, the inventor finds that he can effect a very rapid and thorough separation without agitating the table, and without power of any kind except the manual labor requisite to change the feed from one table to another, and washing them off by means of the water used in the pipes; he also finds by the employment of the fixed table he can separate particles which cannot be retained in machines which vibrate. By use of the feed openings, C, of the form shown, the discharge of the sand, ore or other fine material is rendered very steady and gradual, as it will be carried through the narrower portion of the openings, while the lighter water will pass over the same through the upper large end of the openings, taking up the material very gradually and distributing it very evenly upon the table. It is obvious that the rotating tube may be sustained in any other manner, and that it may be connected in any suitable manner with the source of the water

The plugs in the ends of the pipes, E, are for the purpose of freeing them of any obstructions.

Fig. 3 represents the most convenient form of erecting the tank or reservoir which supplies the tubes with water, it usually being placed directly overhead with water shed underneath.

Mr. Tolles with this apparatus does not profess to do what many others claim to do, but he is running many of them where everything else has failed. He has been running several of these tables on the Comstock for nearly two years and is now building more. By using the proper kind of sizing apparatus in connection with the tables, the inventor is doing some close work with them at a nominal expense of constructing, running and keeping in order. He states that any person using anything of like nature, or any portion of the same for like purposes, without first obtaining license for so doing, will be prosecuted for damages for such use. Persons at a distance can build and run them by first obtaining license and instructions from the inventor, John U. Tolles, at Eureka, Humboldt county, California, or W. S. Tolles, his authorized agent at Virginia, Nevada.

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## GENERAL MERCHANDISE.

[WHOLESALE.]

TUESDAY M., July 3, 1877.

BAGS—Jobbing.	
King Standard Wheat, 9 @ 91	
Wheat & Co's, 3 @ 25	
Hand Sewed, 22x36, 9 @ 91	
24x36, 10 @ 91	
22x40, 11 @ 91	
Machine Sewed, 22x36, 9 @ 91	
Flour Sacks, 14x24, 4 @ 91	
Quarters, 5 @ 64	
Eighths, 4 @ 64	
Heaven, 60 inch, 12 @ 91	
40 inch, 12 @ 91	
40 inch, 12 @ 91	
Wool Sacks, 3 @ 50	
Hand Sewed, 3 @ 50	
Machine Sewed, 4 @ 50	
4 @ 50	
Standard Gunnies, 14 @ 15	
Bean Bags, 7 @ 8	
CANDLES.	
Crystal Wax, 12 @ 19	
Eagle, 12 @ 19	
Patent Sperm, 28 @ 30	
CANNED GOODS.	
Assorted Pie Fruits, 2 @ 75	
2 @ 75	
Table, 3 @ 25	
Jams and Jellies, 4 @ 25	
Pickles, 1 @ 30	
Sardines, 1 @ 65	
Ht Biscuits, 3 @ 60	
COAL—Jobbing.	
Australian, ton, 3 @ 9 25	
Coca Bay, 8 @ 00	
Bellingham Bay, 8 @ 00	
Seattle, 8 @ 00	
Cumberland, 14 @ 00	
Mt Diablo, 5 @ 75	
Lehigh, 22 @ 00	
Liverpool, 3 @ 00	
West Hartley, 4 @ 00	
Scotch, 7 @ 00	
Scranton, 13 @ 00	
Vancouver, 10 @ 00	
Charcoal, sack, 75 @ 00	
Coke, hbl, 60 @ 00	
COFFEE.	
Handwich Id, 2 @ 21	
Costa Rica, 18 @ 20	
Guatemala, 18 @ 20	
Java, 24 @ 00	
Manilla, 19 @ 13	
Ground, in es, 25 @ 00	
FISH.	
Sac to Dry Cod, 5 @ 6	
Clam, 1 @ 15	
Eastern Cod, 7 @ 15	
Salmon, hbl, 8 @ 50	
Ht hbl, 4 @ 50	
Liverpool, 3 @ 50	
Pld Cod, hbl, 22 @ 00	
Ht hbl, 11 @ 00	
Mackerel, No. 1, 14 @ 00	
Ht hbl, 14 @ 00	
14 @ 00	
Ex Moss, 3 @ 00	
Pld Herring, hbl, 3 @ 00	
Boston Sunk Hg, 40 @ 30	
LIME, ETC.	
Lime, Sta Cruz, 2 @ 00	
hbl, 2 @ 00	
Cement, Rosen, 2 @ 75	
Portland, 4 @ 75	
Plaster, Golden, 3 @ 00	
Gate Mills, 3 @ 00	
Land Plaster, to 10 @ 12	
NAILS.	
Assorted sizes, keg 3 @ 25	
METALS.	
WHOLESALE.	
THURSDAY, M., July 5, 1877.	
IRON.	
American Pig, ton, 32 @ 30	
Scotch Pig, ton, 32 @ 30	
White Pig, ton, 32 @ 30	
Oregon Pig, ton, 32 @ 30	
Reinforced Bar, 3 @ 00	
Horse Shoes, 5 @ 00	
Nail Rod, 7 @ 00	
Norway, Oval, 7 @ 00	
Roller, 7 @ 00	
Copper.	
Copper Tinned, 37 @ 40	
Sheathing, lb, 37 @ 40	
Sheathing, Yellow, 21 @ 22	
Sheathing, Old Yellow, 21 @ 11	
Composition Nails, 21 @ 11	
Composition Bolts, 24 @ 00	
STEEL.	
English Cast, lb, 14 @ 25	
Anderson & Woods, ordinary sizes, 14 @ 00	
Drill, 16 @ 00	
Flat Bar, 15 @ 20	
Flow Steel, 8 @ 12	
TIN PLATES.	
10x14 I.C. Charcoal, 9 @ 90	
Banco Tin, 24 @ 00	
Australian, 19 @ 20	
ZINC.	
By the Case, 11 @ 00	
Zinc Sheet 7x3 ft, 7 to 10, lb, 11 @ 00	
7x3 ft, 11 to 14, 11 @ 00	
8x3 ft, 8 to 10, 12 @ 00	
8x3 ft, 11 to 10, 12 @ 00	
NAILS.	
Assorted sizes, 3 @ 25	
QUICKSILVER.	
By the lb, 41 @ 42	

## LEATHER.

[WHOLESALE.]

WEDNESDAY M., June 27, 1877.

Sole Leather, heavy, lb, 36 @ 29	
Light, 22 @ 24	
Jodot, 8 Kil, doz, 48 @ 00	
11 to 13 Kil, 68 @ 00	
14 to 15 Kil, 82 @ 00	
Corneil, 11 to 15 Kil, 57 @ 00	
Corneil, 12 to 16 Kil, 57 @ 00	
Female, 12 to 13 Kil, 63 @ 00	
14 to 16 Kil, 60 @ 00	
Simon, 12 to 13 Kil, 58 @ 00	
14 to 15 Kil, 66 @ 00	
16 to 17 Kil, 72 @ 00	
Shoon, 18 Kil, 60 @ 00	
24 Kil, 72 @ 00	
Robert, 7 and 9 Kil, 35 @ 00	
Kina, French, lb, 100 @ 1 35	
Good French, lb, 100 @ 1 35	
Best Jodot, lb, 100 @ 1 35	
Leather, Harrow, lb, 35 @ 00	
Fair Horse, doz, 48 @ 00	
Sidling, lb, 33 @ 37	
Well, doz, 30 @ 00	
Buff, lb, 18 @ 20	
Wax Side, 17 @ 18	

## LUMBER.

TUESDAY M., July 3, 1877.

CARGO PRICES.	
REDWOOD.	
Rough, M, 14 @ 00	
Refuse, 10 @ 00	
Clear, 24 @ 00	
Clear Refuse, 14 @ 00	
Rustic, 27 @ 50	
Surfaced, 24 @ 00	
Refuse, 14 @ 00	
Flooring, 26 @ 00	
Refuse, 14 @ 00	
Beaded Flooring, 26 @ 00	
Refuse, 14 @ 00	
Half-inch Siding, 20 @ 00	
Refuse, 16 @ 00	
Half-inch Surfaced, 20 @ 00	
Refuse, 15 @ 00	
Half-inch Battens, 18 @ 00	
Picket, Rough, 12 @ 00	
Picket, Pointed, 14 @ 00	
Shingles, 2 @ 00	
OFFICUT SOUND PINE.	
RETAIL PRICE.	
Fencing, 18 @ 00	
Flooring and Siding, 18 @ 00	
Narrow, 20 @ 00	
2d quality, 25 @ 00	
Laths, 3 @ 50	
REDWOOD.	
RETAIL PRICE.	
Rough, M, 18 @ 00	
Refuse, 15 @ 00	
Picket, Rough, 18 @ 00	
Pointed, 20 @ 00	
Fancy, 25 @ 00	
Siding, 22 @ 00	
Long Beaded, 22 @ 00	
Flooring, 32 @ 00	
Refuse, 22 @ 00	
Half-inch Surfaced, 32 @ 00	
Refuse, 22 @ 00	
Half-inch Battens, 22 @ 00	
Picket, Rough, 12 @ 00	
Picket, Pointed, 14 @ 00	
Shingles, 2 @ 00	

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Again thanking you for your promptness in securing my patent, I remain, obediently yours,

WM. H. HARRISON.

Thanks for Prompt Attention.

STOCKTON, June 26th, 1875.

Messrs. DEWEY & Co., S. F.:—

I have received the patent for my invention in wagon brakes, which you procured for me; patented May 11th, 1875, No. 163,046. Thanks to you for your prompt attention to the case; you will hereafter be my attorneys in such cases. I recommend all inventors on the Pacific Coast to give you a call, which I think they will never have any cause to regret. Very truly yours,

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Those who cannot call will be given further information by consulting our agents or sending to this office.

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An amendment to Section 336 of the California Code, taking effect July 1st, 1874, provides that in addition to the regular publication, daily or weekly, of the assessment and sale notices as heretofore,

## PERSONAL NOTICE

Must be served as provided in the following quotation from the law:

"The notice must be personally served upon each stockholder, or in lieu of personal service, must be sent through the mail, addressed to each stockholder at his place of residence, if known, and if not known, at the place where the principal office of the Corporation is situated."

The above refers to the ASSESSMENT NOTICE only. Advertisers in the MINING AND SCIENTIFIC PRESS will be furnished with copies of assessment notices printed on slips suitable for serving personal notice under this law at short notice.

DEWEY &amp; CO., Publishers.

## Mining and Other Companies.

Persons interested in incorporated shares will do well to recommend the publication of the official notices of their companies in this paper, as the cheapest appropriate medium for the same.

**Bella Union Quicksilver Mining Company.**—Location of principal place of business, San Francisco, California. Location of works, Napa County, California.

Notice is hereby given that at a meeting of the Board of Directors, held on the twenty-eighth day of June, 1877, an assessment of ten cents per share was levied upon the capital stock of the corporation, payable immediately in U. S. gold coin, to the Secretary, at the office of the company, No. 312 Montgomery Street, San Francisco, Cal.

Any stock upon which this assessment shall remain unpaid on the thirtieth day of July, 1877, will be delinquent, and advertised for sale at public auction, and unless payment is made before, will be sold on Saturday, the twenty-fifth day of August, 1877, to pay the delinquent assessment, together with costs of advertising and expenses of sale. By order of the Board of Directors, ABRAHAM HALSEY, Sec'y.

**California Fruit Growing Association.**—Principal place of business, San Francisco. Location of property, El Dorado county, Cal.

Notice is hereby given, that at a meeting of the Board of Directors, held on the second day of July, 1877, an assessment of \$1.50 per share was levied upon the capital stock of the corporation, payable immediately in U. S. gold coin, to the Secretary, at 331 Sansome Street, S. F.

Any stock upon which this assessment shall remain unpaid on the sixth day of August, 1877, will be delinquent, and advertised for sale at public auction, and unless payment is made before, will be sold on Tuesday, the thirtieth day of August, 1877, to pay the delinquent assessment, together with costs of advertising and expenses of sale.

HORACE JONES, Sec'y.

Office, 331 Sansome Street.

**Consolidated Bonanza Gold and Silver Mining Co.**—Location of principal place of business, San Francisco, California. Location of works in Eagle and Washoe Valley Mining District, Ormsby county, Nevada.

Notice is hereby given, that at a meeting of the Board of Trustees, held on the fourth day of July, 1877, an assessment of No. 1, of 10 cents per share was levied upon the capital stock of the corporation, payable immediately in U. S. gold coin, to the Secretary at the office of the company, No. 13 First Street, San Francisco, California.

Any stock upon which this assessment shall remain unpaid on Tuesday, the tenth day of July, 1877, will be delinquent and advertised for sale at public auction, and unless payment is made before, will be sold on Tuesday, the thirtieth day of July, 1877, to pay the delinquent assessment, together with costs of advertising and expenses of sale. By order of the Board of Trustees, WM. MARTIN, Secretary.

Office No. 13 First Street, San Francisco, Cal.

**Excelsior Silver Mining Company.**—Location of principal place of business, San Francisco, California. Location of works, Folsom District, Lincoln county, Nevada.

Notice is hereby given that at a meeting of the Board of Directors, held on the twenty-seventh day of June, 1877, an assessment of ten cents per share was levied upon the capital stock of the corporation, payable immediately in U. S. gold and silver coin, to the Secretary, at the office of the company, 306 Post Street.

Any stock upon which this assessment shall remain unpaid on the twenty-seventh day of July, 1877, will be delinquent and advertised for sale at public auction, and unless payment is made before, will be sold on Monday, the twentieth day of August, 1877, to pay the delinquent assessment, together with costs of advertising and expense of sale.

W. A. KOLLMYER, Sec'y.

Office, 306 Post Street, San Francisco.

**Mariposa Land and Mining Company of California.**—Location of principal place of business, San Francisco, California. Location of works, Mariposa county, Cal.

Notice is hereby given that at a meeting of the Board of Directors, held on the sixth day of June, 1877, an assessment of No. 11, of \$1.00 per share was levied upon the capital stock of the corporation, payable immediately in United States currency, to the Secretary at the office of the company, room 33 Nevada Block, No. 309 Montgomery Street, San Francisco, California, or to the Assistant Secretary, at the office, No. 9 Nassau street, New York, N. Y.

Any stock upon which this assessment shall remain unpaid on the sixth day of July, 1877, will be delinquent and advertised for sale at public auction, and unless payment is made before, will be sold on Wednesday the twenty-fifth day of July, 1877, to pay the delinquent assessment, together with costs of advertising and expenses of sale. By order of the Board of Directors, LEANDER LEAVITT, Secretary.

Office, Room 33, Nevada Block, No. 309 Montgomery street San Francisco, Cal.

**Silver Sprout Mining Company.**—Principal place of business, San Francisco, State of California. Location of works, Kearsarge Mining District, Inyo County, State of California.

Notice is hereby given, that at a meeting of the Board of Directors, held on the twenty-third day of May, 1877, an assessment of five cents per share was levied upon the capital stock of the corporation, payable immediately in United States gold coin, to the Secretary at the office of the company in San Francisco.

Any stock upon which this assessment shall remain unpaid on the twenty-fifth day of June, 1877, will be delinquent, and advertised for sale at public auction, and unless payment is made before, will be sold on Monday, the sixteenth day of July, 1877, to pay the delinquent assessment, together with costs of advertising and expenses of sale.

T. B. WINGARD, Secretary.

Office, Room 20, No. 323 Montgomery Street, San Francisco, Cal.

**POSTPONEMENT.**—The day for deeming Stock delinquent on the above assessment is hereby postponed until Monday, the 23d day of July, 1877, and the sale thereof until Monday, the 16th day of August, 1877. By order of the Board of Trustees, T. B. WINGARD, Sec'y.

**Union Consolidated Silver Mining Company.**—The Annual Meeting of the Stockholders of the above named company, for the election of Trustees, and the transaction of such other business as may be presented, will be held on Monday, July sixteenth, 1877, (third Monday in July), at two o'clock P. M., on that day, at the office of the corporation, Rooms 3 and 4 second floor, 309 California St., over Etna Insurance office, San Francisco, Cal. Transfer books closed on Monday, July 9th, 1877, at three o'clock, P. M.

J. M. BUFFINGTON, Sec'y.

## Gold, Legal Tenders, Exchange, Etc.

[Corrected Weekly by SUTRO &amp; Co.]

SAN FRANCISCO, July 3, 3 P. M.

LEGAL TENDERS in S. F., 11A. M., 95¢. SILVER, 4@41.

GOLD in New York, 100 @ 100.

GOLD BARS, 800 @ 90. SILVER BARS, 10 @ 15 @ cent. discount.

EXCHANGE on New York, 50 @ 55-100 @ cent. premium for gold on London, 48 @ 49; Commercial, 48 @ 49; Paris, five francs @ dollar; Mexican dollars, 34 @ 35.

LONDON Consols, 94 @ Bonds, 107 @.

QUICKSILVER in S. F., by the flask, 41 @ 42.



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**PACIFIC ROLLING MILL COMPANY,**  
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Established for the Manufacture of  
RAILROAD AND OTHER IRON

Every Variety of Shafting,

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Hammered Iron of Every Description and Size.

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The highest price paid for Scrap Iron.

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**PRACTICAL BOILER MAKERS,**

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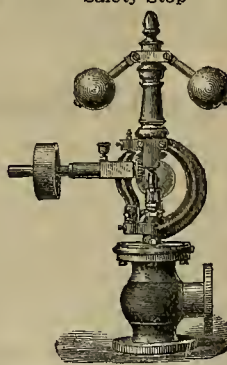
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**Cost of Roasting and Chloridizing 20 Tons in 24 Hours by this Process:**

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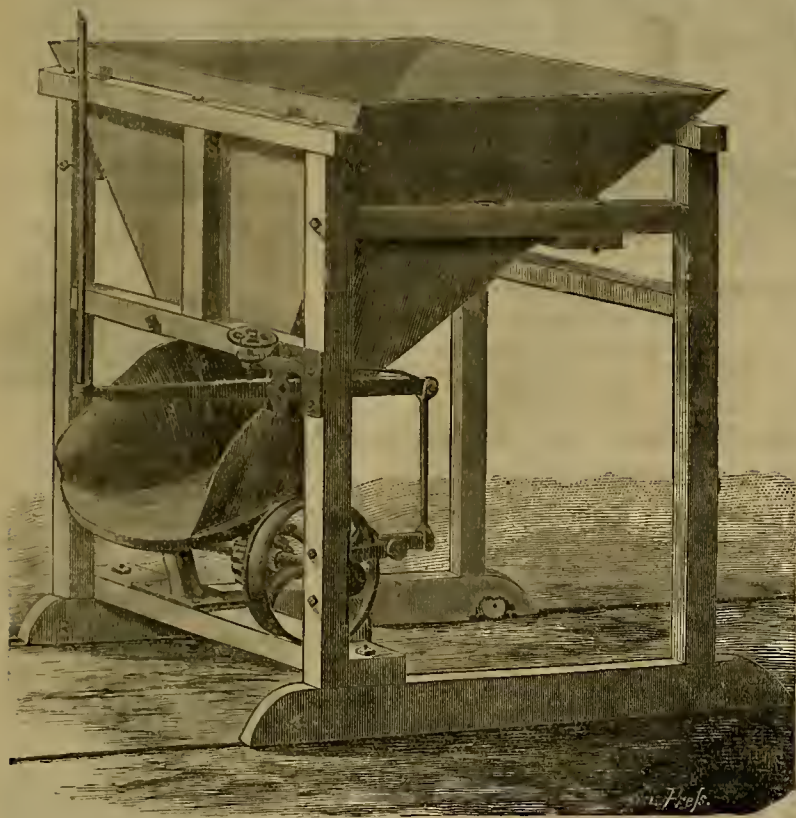
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**REFERENCES.**

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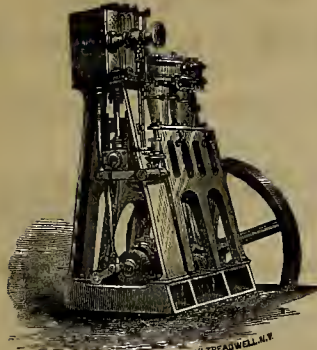
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POSITIVELY UNEQUALLED FOR  
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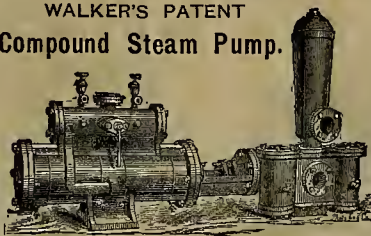


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ROCK DRILLS

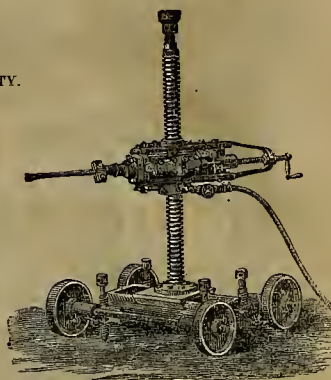
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This book is free from trash, and solid throughout; all its matter is intelligible to men of ordinary education, and all of it is valuable to miners.—*S. F. Daily Alta*.

In the several sections the work is eminently practical. Is very comprehensive, and contains a great deal of useful information which cannot be obtained from the previous books that have been written on these subjects.—*S. F. Daily Examiner*.

It affords a vast quantity of information as to the appearance and value of different ores.—*S. F. News Letter*.

It is the best single English treatise we know of for the use of prospectors and practical miners.—*The Engineering and Mining Journal, New York*.

Sold by Dewey & Co., at this office. Price \$10.50.

## Testing and Working Silver Ores.

The above is the title of an illustrated work of 114 pages, for miners and prospectors, by Chas. H. Aaron, which has just been issued by Dewey & Co. Mr. Aaron has managed to give many useful hints and suggestions, free from all technicalities, and in such a style as to be easily comprehended. It is written for the miner, with no chemical symbols or metallurgical technicalities to confuse those who are not chemists or metallurgists. The following summary of the contents of the work will give an idea of its scope.

Under the heading of the first chapter, "Testing Ores for Silver," we find paragraphs on ore formation, test for silver, with heat and water, acid or blow pipe. In speaking of testing for a process, the extent and richness of ore is considered, smelting ores, selecting and working sample, appliances for testing, roasting, etc. Under the head of "Working Ores" the author describes Aaron's process, has something to say of superheated steam, preparation of chloride of copper and protochloride of copper, use of copper and iron, quantity of chemicals, carbonate of lime, chloride ores, amalgam, Patchen's process, etc. He also describes the methods of working roasted ores, treatment of base metals, stirring, heat of furnace, want of sulphur, etc. Under the head of "Leaching Processes" are the titles, Smelting, Mexican process, Chilean process, Kroenke's process, etc. Under "Pulverizing Machines" are described the armstrut and its construction and operation, stamp batteries, screens, Crocker's trip-hammer battery, Paul's pulverizing barrel, Kendall's battery, Noice's pulverizer, a cheap rock breaker, etc.

In speaking of amalgamators the author describes a cheap amalgamator, grinding the ore, directions for making a barrel, preventing mechanical wear, use of quicksilver, copper in bars, Freiberg barrel, cheap barrel trough, barrel on rollers, Aaron's amalgamator, separator, etc.

He describes an improvised retort, roasting furnace, furnace tools and furnace building. Among the miscellaneous mention may be found Aaron's leaching apparatus, with two or three different arrangements, a small mill, sampling tallies and settling tanks, dichloride of copper, etc. Mr. Aaron is a practical miner, of long working experience on this coast.

The book is a serviceable one for miners' and prospectors' use. Price, post free, \$2.00. Address Dewey & Co., MINING AND SCIENTIFIC PRESS, 224 Sansome Street, San Francisco.

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We have just issued a pamphlet containing the General Mineral Land Laws of the United States, with instructions of the Commissioner of the Land Office. The contents of this pamphlet comprise all of the Government laws with relation to mineral lands of interest to the mining community, as follows: Mining Statute of May 10th, 1872, with Instructions by the Commissioner of the Land Office; Mining Statute of July 26th, 1863; Mining Statute of July 9th, 1870. Forms required under Mining Act of May 10th, 1872, as follows: Notice of Location; Request for Survey; Application for Patent; Proof of Posting Notice and Diagram of the Claim; Proof that Plat and Notice remained Posted on Claim during Time of Publication; Register's Certificate of Posting Notice for Sixty Days; Agreement of Publisher; Proof of Publication; Affidavit of \$500 Improvements; Statement and Charge of Fees; Proof of Ownership and Possession in Case of Loss or absence of Mining Records; Affidavit of Citizenship; Certificate that no Suit is Pending; Power of Attorney; Protest and Adverse Claim; Non-Mineral Affidavit; Proof that no Known Veins Exist in a Placer Claim, etc. There is also given the U. S. Coal Land Law and Regulations thereunder. The work comprises thirty pages, and will be sold, post-free, for 50 cents. It should be in the hands of every one having any mining interests. DEWEY & CO., Publishers of the MINING AND SCIENTIFIC PRESS, S. F.

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# MINING AND SCIENTIFIC PRESS

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BY DEWEY & CO.,  
Patent Solicitors.

SAN FRANCISCO, SATURDAY, JULY 14, 1877.

VOLUME XXXV.  
Number 2.

## The National Duplex Air Compressor.

The accompanying engraving represents the duplex air compressor, manufactured by the National Drill and Compressor Company. This compressor has two steam cylinders, 12x42 inches, and two air cylinders, 15x42 inches, being double-acting. The air pistons work within one-sixteenth of an inch of the cylinder heads; the piston and cylinder heads present plain surfaces to each other, so that practically the air is all discharged at each stroke.

The water circulation for cooling passes spirally around the air cylinder from the center to each end, keeping it perfectly cool without mingling the water and air as is done in other compressors. This feature is comparatively new, and is covered by letters patent. In compressing the air in this manner all its expansive force is left, while the mingling of air and water decreases the expansion, it is said, one-third, this being one of the grounds on which the economy of this machine is claimed.

The inlet and outlet valves can be taken out without disturbing any other part of the machine. The agents claim that the machine will compress air to the same pressure as that of steam used; the amount of free air compressed at a piston speed of 250 feet being about 1,000 cubic feet per minute. They get a greater pressure of air than the pressure of steam used, by increasing the size of the steam cylinder or decreasing that of the air cylinder. We are told that at 400 feet of piston speed this machine will give 125-horse power with steam at 90 pounds. The outlet valves have less lap than those heretofore in use, and accordingly do not cause any greater pressure in the cylinder than in the receiver. There is a difference in this respect from other compressors, some of which used 50% additional power to overcome this lap, and others again are compelled to use levers to force the outlet valve off its seat.

The combination of these machines together practically remedies the loss that has attended the building of air compressors and steam engines on separate beds and combined only by the shaft. All strain and pressure is in this way equalized, and the sudden halt and jar so common to compressors is avoided. This machine is simple and is claimed to be able to develop more power in proportion to cost and consumption of fuel than machines of this kind.

That compressed air is destined to play a conspicuous part in the development of the mining resources as well as many branches of mechanics in this country, no one that has given the matter any thought can doubt. The fact that air can be, and is, now carried many miles without appreciable loss, proves that at no distant day some mines that do not now pay for working, on account of the high price of fuel and the slow manner of sinking or drifting, will avail themselves of the advantages and utilize many streams that are running to waste. This company build a compressor that is run by water power, entirely different from anything in use. It is claimed to be of greater capacity than others in the market for the same money. They are prepared to make proposals and set these machines up in any part of the world. The company has recently put up for the Republic Iron Company, at Marquette, Mich., some air compressors at a water power nearly a

mile from their mine. The air in this case is compressed to a pressure of 60 pounds to the square inch by water, and is conveyed to the mine through 5,000 feet of iron pipe, where the large hoisting engines and all the other machinery are run by it instead of steam, as formerly, doing away entirely with the cost of fuel. The rock drill, the companion of this compressor, is made in such a manner that the company say they will guarantee greater durability and more work than any other drill. They ask for trials against other machines. These machines are used by the Republic Iron Company, Lake Superior, the Pennsylvania Railroad Company, the Forest of Dean iron mines, the Idaho mining company, Grass Valley, the Pittsburg mining company and many others. The agents claim that the National Drill is the victor over all other machine drills in the market. Those desiring further particulars concerning this machinery, can address the National Drill and Compressor Company, office at Berry & Place's,

## Quicksilver.

Quicksilver still continues to be quoted at a very low price, with no immediate prospects of any improvement. Although this is a very good thing for miners generally, it is pretty rough on the quicksilver men, who can scarcely make the two ends meet at present prices. A great many mines have closed down because they would not pay to work with quicksilver at 42½ cents. Two years ago, when the quicksilver excitement was at its height, a great many persons located mines and went to work on them, and by the time they were in a shape to be productive and profitable, the price of mercury declined so much that they had to give up. Some of those who invested in mines of this character at the wrong time, expecting that quicksilver would go up instead of down, were sadly disappointed and lost considerable money.

## Mining Patents.

The miners are beginning to find out that when they have a mine that has good prospects it is as cheap to patent it at once as to keep up the necessary annual expenditures. The law provides that certain work shall be done each year on all mines until a patent is allowed; so that when a patent is granted these enforced expenditures cease. The United States patent to the ground gives a clear title, and intending purchasers always feel easier when a mine is patented. In fact, some will not look at a mine with a view to purchase unless it is patented. It is not only a guarantee of title, but to some degree a guarantee that the mine is not a mere prospect. The miners appreciate these facts, and many more patents to mining claims are now being issued than ever before. The latest list is as follows:

California—Nevada County—Pennsylvania quartz lode and placer, to Pennsylvania gold mining company; Republic quartz mine, David W. Schnapp, Sierra County—Ariel and Buttes Union quartz mines, Sierra Buttes company.

Nevada—Eureka County—Silver State and Original Baltic mines, to Gustave Peterson and others; Shoo Fly (Nos. 2 and 3) and Jefferson Lodes, Thos. J. Taylor. White Pine county—Nevada Chief mines and mill-site, Wm. Cray and others; Genesee lode and mill-site, Chas. E. Ramsdell; O. H. Joe mine, Thos. Wren; Mohawk lode and mill-site, John Hammond; North and South John Wild mines and mill-sites, Frank and Olive Drake; Curtis & Keller mine, A. S. Rich; Paymaster, Young America, Defiance and Carolina mill-sites, to Martin White mining company.

Utah—Queen Bees mine, Elisha Freeman; Stella mine, Benjamin Raybold; Little Fred mining and tunnel company, Yopina Extension Northeast mine, Isidor Morris; Galeana mine, S. N.

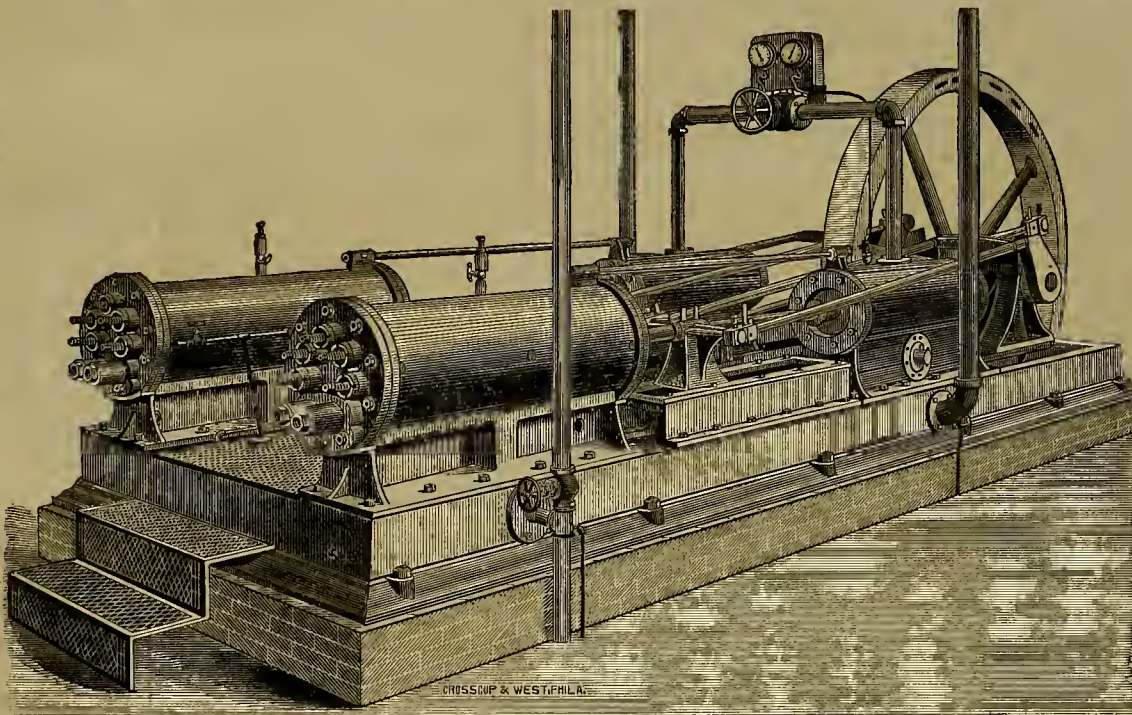
Osborn; Mary Ellen mine, S. F. Nuckolls and others; Becktel mine, Isaac Rolland.

Arizona—Yavapai county—Thomas mine, E. E. Burlingame and others.

Montana—Bismarck and Von Arnim lodes, Phillip Miller and others; Golden Leaf mine, Phillip Snemman; Trapper mine, Jas. A. Bryant; La Plata mine, John Downs; War Eagle mine, Robert S. Hale; Old Dan Tucker mine, Emanuel Redding and others; Little Emma and Salmon and Cliff Extension mines, Eli D. Holland and others; Hell Gate and Avalanche ditch and placer mine, Wm. O. Warner and others; Atlantic, South Alta, Hecla, Avon and Cleve lodes, Noah Armstrong and others.

At a stockholders' meeting of the North Consolidated Virginia mining company, it was resolved that the Trustees be prohibited from disposing of the 23,125 shares of the delinquent capital stock bought in by the company on June 12th, until authorized by a meeting of the stockholders. They were also prohibited from selling the working capital on hand—7,195 shares.

THE *Inter-Ocean's* Bismarck special says: The steamer *Fletcher* has just arrived from the Little Big Horn, bringing the remains of General Custer and other officers massacred with him on June 25th, 1876. They will be taken to Fort Lincoln for the present.



THE NATIONAL DUPLEX AIR COMPRESSOR.

corner of Market and Fremont streets, in this city.

PRECIOUS DUST.—The dust which has been allowed to accumulate upon the roof of the Philadelphia Mint during the past twenty-five years, was collected recently by order of Governor Pollock, for the purpose of ascertaining what proportion of metal it contained. The roof is of asphalt and as it softens, the dust sticks to it tenaciously. Some amount of difficulty was consequently experienced in removing it. Finally a quantity amounting to 1,732 pounds in weight was removed and this has just been submitted to the usual assaying process, and the result shows that 42 ounces of standard gold and 76½ ounces of standard silver, worth the total valuation of about \$850, has been conveyed in the upward flight of the smoke of the chimney to the place where it became located.

At the mouth of Dutch Bill canyon, on Russian river, Jim English, a veteran redwood chopper, exhibits a redwood tree from which he has taken lumber enough to build his dwelling house, outbuildings, corral, fenced his farm, and besides made 250,000 shingles, 1,000 posts, 6,000 shakes, and there is timber enough remaining in the tree to make 300,000 more shingles. Another tree has been cut in the neighborhood from which 50,000 feet of clear lumber has been made.

In Lake, Napa, Sonoma, Solano, Trinity, San Luis Obispo, and several other counties, the new industry of quicksilver mining was taken up with avidity by a large class of people. Many left their other avocations to engage in this class of mining, which seemed to promise large profits with less risk than is incident to ordinary mining operations. As a matter of course, some of these people made money, while the product was selling at a dollar and a half per pound and lower, but as it gradually fell below the dollar, the mines began to close down, until now there is not one mine at work where there were ten at that time. Even the large mines of course feel the depression, and at the Almaden, the largest mine on the coast, the number of men employed is less than at any time before, and of nine furnaces at its works, only three are in operation.

A large proportion of the smaller mines have closed down altogether, or until such time as the price of quicksilver warrants their resuming operations. As soon, however, as quicksilver shows any tendency to go up, the larger mines can increase their production to keep pace with the demand, and there now seems very little chance of the smaller mines having an opportunity to do much for some time to come. On the 1st of January this year quicksilver was selling at 75 cents per pound, and now it is only about 42 cents, so that even a good many mines that were at work at the beginning of the year have been compelled to discontinue operations.



### Hydrocarbons as Fuel.

There is much to be discussed and ventilated yet as to this substitution of a fuel other than coal for the generation of steam in locomotive or marine engines. The points of advantage to be sought for are not only in economy of coal, but equally in less weight to be carried, and less room required for storage. A patent recently taken out by Mr. Walker, C. E., F. R. G. S., covers an arrangement by which air is converted into hydrocarbon gas of great heating power and is then stored in a chamber subjected to considerable pressure, and is thereby forced out again through a pipe to the perforated tubes from which combustion takes place in the furnace, and by burning hydrocarbons (with the gas) in a gaseous or much divided state, without the adjunct of external heat to gasify or divide them. The heavy oils in this divided or gasified state burn over this grate in conjunction with the hydrocarbon gas.

The principle is thus of extreme simplicity, and the practical arrangements are equally so, insuring a certainty of operation and reducing the question of advisability to one only of cost and convenience. The comparison for storage room and economy will be best made from the following data: that if the calorific power of coal per pound be estimated at 8,000 calorific units, then that of liquid hydrocarbon per pound must be taken at 13,000 units, which gives an advantage, weight for weight, of 62½% in heating power to a liquid hydrocarbon compared with coal. Again, in the combustion of coal, as carried out in the usual construction of our boilers and fire-grates, only a very small proportion of the heat theoretically developed can be made use of, whilst by the use of burning gas and hydrocarbon in a gaseous form close home to the heating surfaces, it seems that a much greater percentage of useful evaporation could be secured. A comparison of useful calorific effect obtained from coal or hydrocarbons has been made to this effect: that in the pound of coal only 50% calorific effect is utilized, or 4,000 units, which is probably much over rather than under the mark, and in the case of the hydrocarbon, 100%, as nearly as possible, or 8,000 units is claimed to be utilized. The comparison, then, of one pound of liquid hydrocarbon being equal in evaporating power to 2.28 pounds of coal, seems fully justified. This will at once effect a large economy in storage room, as less than half the weight of fuel for a given voyage would be required, and probably less than half the space of storage. This would prove very valuable to sea-going steamers, as giving them more valuable freight-carrying room, or capability of running three times a longer voyage without re-coaling. It is probable that the relative cost of fuel would be about the same for both the petroleum and the coal; but the chief gain does not lie in the comparative cost so much as in the convenience and saving of storage room and labor. In the latter item alone a very large proportion of the stokers might be dispensed with, as the gas and oil would be self-supplied by pressure, subject only to regulation by hand as to the amount. Regularity of combustion and the equality of temperature ought to have a beneficial effect upon the plates in preserving them from expansion and contraction, and hence from wear and tear. A valuable point to be noticed in such a gas furnace is the command which can be in the hands of a single individual to at once extinguish or light up, or diminish or increase the fire. There is also great cleanliness about such a system; no smoke, we should suppose, and no cinders or ash to get rid of, and little or no soot.

The combination of burning hydrocarbon gas with the heavy oils, which forms the principal fuel that Mr. Walker proposes to use, would also prove useful on board ship as a means of lighting, and it would also be thus readily put under the control of the captain or other responsible officer. The system advocated by Mr. Walker is to burn both heavy and light hydrocarbon oils. The former is hydrocarbon gas and the latter in atomized form, the atmospheric air passing through them. The gas will vary in its degree of saturation according to the temperature of the liquid. The combination of volatilized petroleum of hydrocarbon with atmospheric air is highly inflammable, and gives off great heat at one degree of saturation, as a comparatively colorless flame, or considerable light at another degree of saturation, and is thus most serviceable either as a source of evaporation or as a lighting medium.

A further very large field for the successful use of this petroleum fuel may be in metallurgical operations, such as the reduction of metals, and particularly in the case of iron smelting. The chemical purity of the gases of combination and the absence of deleterious matters, such as sulphur and phosphorus, will prove valuable in producing the purest and most perfect qualities of wrought iron or steel. The method of mixing a certain proportion of air either in the air-gas or afterwards in the furnace, affords a most convenient means of producing either a reducing or oxidizing flame, as may be desired. This system should also prove very economical in amount of fuel required for reduction, as the waste heat could be so well utilized for heating the air injection.

The mechanical arrangements for carrying out this system are simple. A tube, which supplies the hydrocarbon gas from the tank, is conducted into a series of perforated tubes taking the place of the usual fire-bars. Upon these bars is some-

times laid a layer of asbestos to absorb and render radiant some of the heat, giving an increased economy of about 10%. From these perforated tubes the gas rises in vivid combustion over the fire-bars flame, and passes along the flues as in the case of an ordinary fire.

If we analyze the effect produced by this mode of combustion, we shall find that the heavy oils projected in the form of minute globules into the already hot furnace, present a great surface to the oxidizing effect of the air which surrounds them and which has been their vehicle, therefore they get inflamed instantaneously throughout the mass. The residues of this combustion, which takes place in this divided state, being so minute (one-two hundredth part of each original globule), they are consequently totally carried away by the draft, at the same time the globules or fine spray being on all sides enveloped in air, perfect combustion is attained. —*London Iron.*

### Pittsburg Mine.

This well known property, says the Nevada County Gazette, situated on the hill above Gold flat, last year passed into the hands of some San Francisco capitalists associated with Captain John White, of Empire and Virginia City notoriety, who are developing its hidden treasure to an unlooked for extent. The property consists of 3,000 by 1,500 feet, the vein running southeast and northwest, on which there have been sunk four shafts; two inclines are the working shafts and two perpendiculars are used for air. The present working shaft has a hoisting works erected at its mouth to take the place of the one burned some time since. This building is 40 by 60 feet; has a 16-inch engine, that does the double duty of hoisting and pumping; a pair of hoilers and an air compressor for running drills in the depths below. The mill, situated a short distance south, consists of 10 stamps, a Eureka scourer and a Kittinger rocking buddle for sulphurets, driven by a 12-inch engine. Although the mill is not in first-class shape, the 50 ounces of amalgam that it yields per 24 hours' run makes it a very desirable accession to this valuable property. The incline shaft at the mill is not being worked at present. The mine yields its richest at the 700-foot shaft, on which the new hoisting works are. This shaft has six levels run at right angles from the shaft that was sunk on the vein, which ran at an inclination of about 30° until reaching the 600, where a slide set the vein at nearly a perpendicular and pinched it nearly in two. It was at this point that the former owners became discouraged and gave up working, thinking the prospect did not justify the outlay which would be necessary to again put the mine in good pay, but chose to retire on an ample competency derived from working the mine in its upper levels. The vein here, as in all such formations—crystalline trap—is not extravagantly wide, averaging from 15 inches to three feet, but is much richer and contains more gold than many of much greater width, and with less rock to handle to obtain it. The mill yield is from \$20 to \$60 per ton, including sulphurets, of which there is five per cent. This lower level, the 700, is being run north, carrying the vein with it into the extension, and is rapidly increasing the farther it goes. A winze has been sunk from the 600 to the 700 in ore the entire distance. When the fact is considered that when the present party bought the mine no ore was in sight, the present extraordinary rich developments reflect great credit on Capt. White, the promoter of the enterprise, for his sagacity and good management in putting the mine in its present good pay and at so trifling a cost. The only drawback there is to this mine now, is the shaft ought to be sunk 300 feet, and additional levels run that would enable the mine to run a 20-stamp mill constantly, and this the company will at once proceed to do, and to this end they have bought and have set up and at work an outfit from the National Drill and Compressor Co., a 14-inch air compressor, driven by steam, and two inch drills, with which they propose to sink the shaft. This drilling outfit merits a few words of explanation. The air compressor is the most compact, powerful and durable style known to mechanical science and embodies many new principles; one important one is compressing air without mingling water with it as all others do, and in this way it adds one-third to its expansion and leaves it without an element that not only decreases its usefulness, but takes from the drill a large amount of power, as no drill can do good work while water is passing through it. Aside from this important consideration the cylinders and rings are always cut badly by using water for the purpose of making air, as all others do, thus rendering the piston anything but air tight, which is very desirable in all air compressors. Another feature is, the piston runs within a thirty-second of an inch of the heads, thus expelling all the air and preventing the back pressure as many do. The air making is done by a water jacket pressing entirely around the air cylinder and surrounding the outlet valve with a water bath that effectually prevents them from heating. This compressor is set at the head of the shaft and a two-inch pipe is run down to the bottom with branch pipes to take power off at each level, for the purpose of running drills, engines or pumps. The drills, like the compressors, are a vast improvement on all others, being light, simple and durable, and having but three working pieces there is no breakage, and they are capable of accomplishing more work than any machines

made. A two-inch hole has been drilled in this hard rock six feet in 40 minutes, changing drills twice in the time. Taking all these improvements, with the richness of the ore and the rapid development proposed, the Pittsburg is destined, under its present management, to take rank among the very best mines in the country and will well repay a careful look from all interested in such matters.

### American Locomotives Abroad.

The London Colliery Guardian says: Our American advices informed us last week that 19 locomotives had left the Baldwin locomotive works, Philadelphia, this month, for Brazil. Each engine was accompanied by an engineer and fireman; a number of machinists also went with the engines. We further learn that 22 more engines are to be despatched, in the course of this year, from the Baldwin works to the great South American empire. The Baldwin works have forwarded besides a specimen locomotive to one of the Australian colonies, and the New Zealand government is also about to make a trial of one of the engines of these now celebrated works. Such facts as these show forcibly enough the energy and enterprise with which American firms are endeavoring to find fresh outlets for the products of American industry. Jonathan is rubbing shoulders with John in all the great markets of the world, and unless John bestirs himself he will find Jonathan rather a formidable rival. One circumstance which, perhaps, tells in favor of American locomotive builders in South America, is the disinclination which English capitalists now display—and not unnaturally—to embark their savings in the securities, so called, of South American governments. We call them South American governments partly by habit and partly by courtesy, but what is a South American government only too often? What but a knot of desperate adventurers who have contrived to seize the helm of State for a time, and who hold it until they are shot down or dispersed by a fresh band of lawless conspirators. We have been fleeced too smartly and too recently by such wretched republics as Venezuela, Honduras, Ecuador, Uruguay, Costa Rica and Peru, to be very eager to acquire any more South American bonds. Brazil and Chile certainly maintain a good credit at present, but neither of these States could raise new loans upon the English market so readily or so advantageously as they once did; and the consequence is that American locomotive builders compete with English firms upon rather more equal conditions than formerly. They ought certainly to do so, since they have not to carry their engines so far over the sea. Perhaps one cause which has rendered the Americans more eager competitors against us—not merely in the matter of locomotive building, but in almost every other branch of human effort—is the dullness of trade within the American republic itself. The Americans have been compelled *per force* to seek for fresh fields and pastures new because they have not been doing quite so well at home.

The appearance of American locomotives upon the railways of Australia is perhaps even a still more serious matter to English mechanical concerns than the dispatch of Baldwin engines to Brazil. Hitherto our Australasian friends have naturally almost entirely relied upon us, their kinsmen, for such locomotives as they required. They have certainly made desultory efforts to build locomotives for themselves, but they have not been very successful in doing so, and in the main they have applied to us when they have wanted some of those mighty iron horses which may be said to be the proudest results of British mechanical skill. But now our Australian friends have listened to the blandishments of Jonathan even in the matter of locomotives.

One at least of the Baldwin bogie engines has gone to one of the British settlements in Australia properly so-called, and the New Zealand government is also disposed to give a Baldwin engine a trial. The introduction of American bogie engines upon Australian and New Zealand railways fairly suggests the question whether English mechanical firms are not too rigid and perhaps even too antiquated in their ideas and notions. The bogie locomotive makes little progress upon English railways, but it is just the thing for young colonies and thinly-inhabited countries, in which railways are constructed in a lighter and more make-shift fashion than could possibly be introduced in Great Britain. A bogie engine will run with safety upon a rougher road-bed, and will overcome sharper curves than an engine with an inflexible frame of the ordinary English type. Let any one watch a train rushing along even upon a well appointed English railway, and he will see that it sways more or less about, although in 999 cases out of 1,000 it contrives to keep to the track. Such an observer will be fain to ask himself whether our express trains would not be safer—even when they glide over a first-class permanent way—if they were drawn by bogie locomotives readily adapting themselves to the little obstacles and difficulties of a line? Even if the inflexible framed engine holds its own pretty well upon a permanent way of the excellence of the London and Northwestern, its bogie competitor is far more adapted to a lightly-ballasted Australian road-bed, or to a line which has to climb some of the hills or mountains of New Zealand. When young Australian colonies map out new lines it is of supreme importance that they should be able to construct them cheaply. Sharp curves and

severe gradients have a tendency to reduce construction expenses; the bogie locomotive is at home upon such curves and gradients, and therefore it is just the engine for the antipodes. We may admit this readily enough, because we ought to be able to make bogie locomotives just as easily as they are now made by our American competitors.

### Puddling with Culum.

Experiments are being made at the works of the Towanda Iron Manufacturing Company, at Towanda, Pa., with the culm or dust of the Loyalsock mines. This coal is called semi-anthracite; it looks very much like the bituminous coal in the vicinity of the works, but lacks the bitumin, is remarkably free from sulphur, and contains over 90% of carbon. The first trial made with the culm was under the boilers, and it was quickly demonstrated that more steam could be generated with it than with coarse coal; and not only so, but that it could be done in less time and with a lighter weight of fuel. Experiments were next made in puddling iron. A common double puddling furnace was used, temporary alteration having been made for the purpose. The firebox was lengthened from 12 feet to 21 feet, so as to increase the grate surface, this being necessary from the fact that the fire must be kept very thin—not over three inches; the grates were placed close together, and contained numerous small holes, their diameter being about the eighth of an inch—in a bar three to four inches wide and two and one-half to three feet long, there would be from 400 to 500 of these holes, and there was about two feet of dead surface between the grate and the bridge-wall. These were the only alterations made, the furnace itself not having been changed. The fuel was introduced in the ordinary way, only it was necessary to spread it very evenly over the grate, and a blast was used. The person who is conducting the experiments says he can get up steam and melt iron quicker with this fuel than with any other coal he ever used, and the iron produced is claimed to be of a superior quality, owing to the freedom of the fuel from sulphur. The works are 25 or 30 miles from the mines, but the owners of the latter offer to deliver the culm at a price not to exceed 85 cents per ton. Further experiments are to be made. —*Coal Trade Journal.*

TESTS FOR BEESWAX.—At a recent meeting of a German chemical society, Herr C. Schmidt, after having called the attention of the society to the frequent adulteration of beeswax with resin, described a modification of the so-called Donath's method of detecting the presence of such adulterating compounds, viz: Five grains of the beeswax to be examined is placed in a vessel with five times its bulk of nitric acid (sp. gr. 1.32 to 1.33) and heated to a boiling point, and permitted to remain at this temperature for a moment; an equal volume of cold water and sufficient ammonia to give it a marked ammoniacal odor is then added. If this alkaline solution contains but pure wax, it will be of a yellow color; while if resin be present it will, on account of the nitrogen compounds formed, be of a more or less intense reddish-brown color. Since this test is a colorimetric one, it is well to prepare a solution with chemically pure wax to be kept as a standard.

FATAL FLUME ACCIDENT.—A dispatch from Oroville, dated the 4th inst., says: A section of the flume of the Sugar Pine Lumber Company, at Flee valley, over 200 feet in length and 70 feet high, gave way yesterday, at 3 P. M., under the pressure of a jam of lumber, which clogged and stopped in running. Before it fell, four white men, named Richard Watson, Patrick Bacon, Charles Campbell and Stevens, and a Chinaman, came down from the mill a short distance above to relieve the jam, and while at work at this dizzy height the flume supports gave way. Watson and Bacon jumped from the flume, and falling under it, were instantly crushed to death by the falling timbers. Campbell and Stevens clung to the falling boxes, and though very seriously injured it is thought they will recover. The Chinaman, being near one end of the break, succeeded in reaching a box that did not fall.

GOLD IN AUSTRALIA.—Up to the end of March the exports of bar gold from Victoria amounted to 93,577 ounces, which is over 45 per cent. less than in the corresponding period last year, when the total was 178,738 ounces. The government has dispatched prospecting parties to various parts of the country to endeavor to discover new auriferous reefs, and the Melbourne Argus states that reports have been received from some of them; but, judging from the nature of the information afforded, it does not appear that much good has yet been attained. The same paper also publishes statistics which show on December 31st last, there were in the colony 41,010 miners, of whom 26,553 worked alluvially and 14,452 quartz miners. The deepest shaft yet sunk is 1,930 feet, and the approximate value of the mining plant is nearly two millions.

USING SPARKS.—Mr. James A. Pea, an engineer on the Montgomery and Eufula railroad, has invented a spark arrester by which, it is claimed, not only is the escape of sparks prevented, but the sparks are collected in a box by means of small pipes, and can be used to sand the track or for ballast.



## MECHANICAL PROGRESS.

## Steel Locomotive Boilers.

One of the topics under consideration at the late meeting of railway master mechanics, at Cleveland, was the relative quality of iron and steel as material for railroad boilers. The testimony was almost unswerving in favor of steel as the best material for the shell of the boiler. We quote from a report of a committee as follows: With two exceptions all express themselves decidedly in favor of steel for the shell of the boiler. It is superior to iron in strength, and less difficult to shape and put together, and seems to be in every way preferable. Those who have used it most extensively for this purpose are the most decided in preferring it.

Not a single instance is reported where steel in the shell of a boiler has ruptured when cold, or in heating up, or from putting cold water in the boiler while hot, as so frequently occurs in the case of the sheets of the fire-box. Mr. Sedgley, of the Lake Shore and Michigan Southern, reports one steel sheet in the shell of the boiler to have cracked or broken in the way common to iron sheets in such cases, caused by imperfect construction or form of the boiler. Mr. Howard Fry, of the Philadelphia and Erie road, reports five steel sheets in the shell of boilers on that road to have cracked during the year 1876, but that in every case it was believed to be the result of bad workmanship or bad design in the form and bracing of the boiler, and not from the quality of the steel.

Your committee believe that the material in the shell of the boilers should be heavier than that in general use; that a greater stiffness and surplus of strength would add greatly to the length of time that they can ordinarily be used with safety, and lessen the cost of keeping them in repair from year to year. As the elastic limit of steel such as used in boilers is not much, if any, above that of iron, the same thickness of steel should be adopted as in the case of iron, notwithstanding its superior toughness. It is important that boilers should be so formed and stayed that with the highest pressure carried no part of one will change its original shape in the least by reason of the pressure. A change in shape in one direction by pressure, and returning again to its original position when the pressure is released, will sooner or later result in a crack. The same is true when braces are attached in such a way that the sheet is drawn from its true position by the strains from the brace. In designing and constructing boilers, these matters should always receive the most careful attention.

Those who have had much experience, and have given the matter close attention, give it as their opinion that steel, being more compact than iron, is less liable to waste away from corrosion, and in that respect is to be preferred. From the expressions made to your committee, we find that steel is rapidly taking the place of iron for the shell of the boiler.

## The Protection of Cars Against Lightning.

The following is from Spang's "Practical Treatise on Lightning Protection," a work recently published by Claxton, Remsen & Haffelfinger, of Philadelphia: A locomotive, with its escaping smoke and steam, moving or at rest, in a thunderstorm, will also invite a lightning discharge, and the liability of damage thereto depends upon the quantity of water that has fallen previous to the discharge, the electrical connection made by the rails with the road-bed, the conducting nature of the road-bed and the earth beneath it; also whether iron cars are in the train. When a number of iron cars, like those used in the transportation of petroleum, are in a railway train, a lightning discharge will be diffused over them and greatly weakened, and thereby lessen the liability of damage to, or ignition of, the contents thereof. But in the case of a wooden car, the discharge will invariably pass through its interior and over inmates or contents in order to reach the earth, the contents being generally a path of much better conductivity than the wooden body of the car. The liability of injury or death of passengers and live-stock, and the ignition of powder or other combustible material by lightning can be greatly lessened by providing two metallic paths (one near each end) between the metal roof and the pedestals, axles and wheels of each wooden car used for their transportation. This can be done at a small expense by applying flat iron bars, two inches wide and one-eighth of an inch thick or four inches wide and one-sixteenth of an inch thick, along one of the sides and bottom of the body of the car, and connecting them with the metal roof and center plates attached to the body, and also metallically connecting the center plates of the trucks with the nearest or most convenient metal rod or bar communicating with the pedestals, thereby forming continuous metallic paths from the metal roof to the center plates, thence to the pedestals, axles, wheels and rails to the earth. During the summer season the rails of a railway track do not constitute very good earth terminals for a lightning conductor, owing to the dry condition and poor conductivity of the road-bed, which generally consists of broken stone or furnace cinder,

a foot or more in depth, and their capacity for diffusing a lightning discharge will depend principally upon the quantity of rain that has fallen previous to the discharge and the conductivity of the road-bed and the earth beneath.

**OLD RAILS FOR NAIL MANUFACTURE.**—A manufacturer at Wheeling, West Virginia, is reported to be making a good quality of nails from old rails. Samples were some few days since shown at the office of the *Wheeling Intelligencer*, part of which were made out of rails, pure and simple, and part out of three parts rails and one part muck. They are pronounced good and are smooth and tough and drive well. This process of making nails, we learn, avoids the process of boiling iron. The rails are cut and piled for the heating furnaces, like so much muck bar, and by the use of a flux in the heating process, are welded and made as malleable, ductile and close-textured in the sheet rolls as so much piled muck. Nail plate is thus made \$5.25 per ton cheaper than out of pig iron which has first been made into muck bar. This saving, says the *Intelligencer*, is of itself a big profit, and will, if successful, revolutionize the old method. No mill can afford to puddle iron when by using this flux, old rails or pig iron can be converted directly into nail plate. The same paper says, also: "We lately mentioned that Colonel Powell is making nails at the Belleville mill out of the old rails and one-eighth muck iron, and that he claims to have an advantage equal to \$13 per ton for pig metal. If this turns out to be the case, the furnaces will not have much to do for some time to come, inasmuch as it is estimated that there are enough old rails in the country to run all the mills for several years."

**RUSSIAN SHIP RAISING.**—At the Russian-American india-rubber factory in St. Petersburg, Russia, a specialty is made of the manufacture of air bags for raising sunken vessels. These bags are generally of a cylindrical form with rounded extremities, about 18 feet in length, 11 feet in diameter, with a capacity of some 600 cubic feet, and each bag can, it is calculated, raise a weight of 60 tons, although they are only guaranteed to lift 50. The bags are made of three thicknesses of coarse canvas, thoroughly impregnated and saturated with india-rubber, and having also layers of the latter material interposed. The valves, etc., are of copper, and the bag is protected by a coarse net, its weight when fully furnished being very nearly 1,000 pounds. Without valves, cordage, chains for attaching it to the object to be raised, such a bag costs about \$1,750, but when provided with all these appliances its price is raised to \$2,720. Last year various experiments were made at Portsmouth, England, with these air bags, which were presented to the English Admiralty by the Russian government, and the *Oberon* was, after one or two attempts, successfully floated by means of them.

**A RAILWAY PILE-DRIVER.**—A pile driver in use in Nebraska is thus described: The engine, hammers, derrick, ladders, etc., and hoisting apparatus are all confined within an ordinary sized freight car. Heavy timber and beams make a strong frame-work for the foundation of the bed of the car. It is built on a circular turntable which is worked on the car, and it can be turned either way, the pile-driver reaching out 20 feet beyond the width of the track. Piling for bridges can be driven on end or side of the track simply by shifting the box of the car around. The machinery is placed within in the most compact and convenient form possible, and embraces all the modern improvements in the latest improved pile-drivers. It works with unusual rapidity, and it is but the work of a moment to attach it to an engine or train.

**IRON SHIP-BUILDING IN THE UNITED STATES.**—According to a statement recently placed at the disposal of the New York *Tribune* by the Register of the Treasury, there have been built in the United States, since 1866, for American owners, 251 iron vessels of all sizes, having a total measurement of 197,500 tons. About 150 were vessels of good size. They rank as follows: Less than 100 tons, 57; from 100 to 500 tons, 73; from 500 to 1,000 tons, 41; from 1,000 to 2,000 tons, 61; from 2,000 to 3,000 tons, 9; from 3,000 to 4,000 tons, 8; over 5,000 tons, 2; total 251.

**SMOKELESS FURNACE.**—We learn from an English exchange that Erskine's patent smokeless furnace is an invention, the novelty of which consists of peculiarly constructed fire-bars, resting directly upon tubes arranged in such a manner that heated air is admitted into the furnace in such proportions as to secure combustion of the gases before the smoke is actually made; it is so arranged that the air passing under the fire, and returning through the tubes, is so greatly heated as to generate steam quickly and give a steadier supply. The bars also afford more air space, which is said to secure entire consumption of the fuel, and to greatly economize the same.

**REDUCING THE PRODUCTION OF TIN PLATE.**—We read in the *Colliery Guardian* that the owners of upwards of 100 mills have been prevailed upon to reduce the make of boxes, the Association of Masters having agreed to close their works one week in every three weeks till the end of the present year, a document having been signed to that effect. A fine of £500 will be enforced against any parties who may violate the conditions of the agreement.

## SCIENTIFIC PROGRESS.

## The Shell Mounds.

Various theories have been suggested to furnish a key to the design and motive which led to the building of the shell mounds which are abundant on this coast. The latest *raison d'être* is described by Mr. C. Mason Kinne, Secretary of the San Francisco Microscopical Society, who has given much thought and inquiry to the subject. He writes: A vast deal of theorizing has been entered into for years past regarding these shell-mounds; as to how they were built, for what purpose and by whom. The last is by common consent conceded to the aboriginal races of red men, and perhaps the process and purpose can be made clear by observing what is going on to-day among the tribes of Indians in the Northwestern country and along Puget sound.

I have given the matter some attention and, whenever opportunity has permitted, have made inquiries regarding the habits of the existing aborigines. From reliable parties long resident in that neighborhood, notably of whom is Mr. Edward Miller, a gentleman who is a close observer of nature, I learn that it is the custom of the native dwellers of the forest to pitch their wigwams, built in the shape of a wooden structure some hundreds of feet in length and proportionately wide, formed of shakes or slabs 30 feet long, three to four inches wide and about two inches thick, which they split out of trees straight grained and clean riven—near to some spot where they find a bed of shell-fish and other conveniences. Sometimes as many as 100 occupants live in a single wigwam, which is divided into stalls or small rooms. Here they live year after year, throwing out of the doors and openings for windows their refuse in the shape of fish-bones, stones for heating water and the shells of clams, mussels and oysters. When the heap outside becomes so great that a rampart, so to speak, is formed about them that becomes troublesome to surmount, they level off a spot and move their dwelling, filling up the depression with the same debris, and so go on, year after year. When a chief dies, they bury him in the mound, which is at once a monument to their appetites and his sepulcher, and migrate to a spot miles away and do not return for 10 years. When other members of the chief's family die, they are sometimes buried with them. The chief usually lives to a ripe old age, which accounts for the fact that the teeth are most always found worn down to the gums. A skeleton recently unearthed from a mound near a new mill at West Berkeley, by Mr. Schnsler, was provided with a large jaw-bone and teeth worn down in a similar manner to the one taken from the mound near Fillmore street, and now in the *Alta* office in San Francisco.

The supposition that these mounds were raised for some religious rites or purposes seems hardly tenable, reasoning from the fact of the known laziness of the primeval man, and the theory that the shells were brought from a great distance to where we now find the mounds is not necessary to account for their inland position any more than it would be to claim that the round boulders and sedimentary deposits of lakes and oceans which have long since sought other levels from the upheavals of their beds, were carted to their present geological position by some Titanic nation of the past.

These shell-mounds cannot rank in interest with the artificial elevations of earth of the mound-builders of the West, which, no doubt, were built for a purpose, and are not the refuse heaps of people whose only aim is to get along with as little exertion of mind or body as is consistent with the aphorism that they live to eat and eat to live.

## The Analysis of the Diamond.

Lavoisier, the great French chemist, undertook the examination of the diamond (Prof. Roscoe remarks), and it is worth while noticing how carefully he went to work—how he proceeded slowly from one step to another in the logical sequence until he arrived at the true solution of the question which he had undertaken to investigate—that is, until he was able to tell exactly what happens when the diamond evaporates in the fire, and why it did not do so when surrounded with charcoal. In the first place, he evaporated the diamond by means of the burning-glass, and he observed that no visible vapor or smoke was given off, but that the diamond disappeared. He thought that perhaps the solid diamond had in some way been dissolved by the water, and that by evaporating the water which was in the lower part of the bell-jar in which he burnt the diamond he might obtain the constituents of the diamond, in a solid form; but he found that no solid residue was left on evaporation, and thus no trace of the diamond could be found. His next experiment was that of placing a diamond in a focus of a less powerful lens than the one he had formerly used, so that the diamond was not heated to so high a temperature as before, again placing it however, in a bell-jar over water. He then

found that the diamond, when not heated quite so strongly, lost only about one-quarter of its weight; it did not disappear altogether, but the remarkable fact was noticed that it became covered with a black substance, which Lavoisier describes as being exactly like lampblack or soot, so that it dirtied his fingers when touched, and made a black mark upon paper. Hence he concluded that the diamond is susceptible of being brought, under certain circumstances, into the condition of charcoal, so that it really belongs to the class of combustible bodies. He was, however, yet far from having proved this point, and he went on experimenting. He next measured the volume of air in which he was going to burn the diamond, and found it about eight cubic inches. Then he burned the diamond in this volume of air by means of a lens, and found that the air had diminished to a volume of six cubic inches, thus showing that the air had undergone some change by the combustion of the diamond, and that two out of eight volumes of air had disappeared. The next experiment he made was to examine the condition of the air in which the diamond had been evaporated. What changes had gone on in the air in consequence of the evaporation of the diamond? After allowing the glass in which he had burned the diamond to stand for four days, he poured clear lime-water into the jar in which the diamond had been evaporated, and he says this lime-water was at once precipitated, in the same manner as if it had been brought into contact with gas evolved into effervescence and fermentation, or that given off in cases of metallic reduction. Here, then, he had got on the track of what he wanted. Hitherto the diamond had apparently disappeared, and nothing was found to account for its disappearance; but now he had found that there was something contained in the air in which the diamond was burned which was not contained in the air before. The next step he took was to examine the white precipitate or powder which formed, and he found that the substance thus precipitated from lime-water by the air in which the diamond had been evaporated effervesced on treatment with acid, and evolved what was then known as fixed air, but which we now know as carbonic acid gas. Here, then, in his last experiment, he completes his proof, showing that exactly the same effects are observed when charcoal is experimented upon instead of diamond. Lavoisier had now run his quarry to earth; he had determined exactly what it is that is formed when a diamond is burned. He has shown that a diamond, when burned, produces exactly the same substance that is produced when common charcoal is burned, and he, therefore, legitimately concludes that the diamond is only another form of the element carbon. The reason that the diamond did not burn in the furnace when surrounded by a mass of charcoal was that the air, or rather the oxygen of the air, could not get to the diamond, because it was kept off by the charcoal, which burned instead of the diamond.

**ELECTRIC PLANT.**—The *Gazette Horticole de Nice* publishes some information respecting a plant of the family of *phytolaccas*, which grows in that country and which possesses electro-magnetic properties. When a branch is cut off, the hand holding it experiences an electric sensation similar to that from a Ruhmkorff battery, and the electrical influence of the plant has been observed several paces from the plant by the deviation of the needle of a small compass. When the compass was placed by the experimenter close to the plants, the needle turned completely round. The soil is said by the *Moniteur Industriel* to contain no trace of iron or other magnetic metal, so that the property is inherent in the plant itself. The intensity of the phenomenon varies with the hour of the day—at night it is almost nil, and most intense during the two midday hours or in a wind; during rain it was weak. No birds or insects have been seen to rest upon the *Phytolacca electrica*.

**CURIOS PHENOMENON OF HEAT.**—M. J. Olivier reports the following experiment: A square bar of steel, about 15 millimeters thick, and about 70 to 80 mm. long, is grasped firmly by the operator, one hand being placed at the center of the bar and the other at the end. The free extremity is pressed strongly against a rapidly revolving emery wheel. In a few minutes the rubbed extremity becomes hot, the hand at the center of the bar feels no heat, but the hand at the remote extremity becomes so hot that the operator is obliged to loosen it.

**WEATHER AND MAGNETISM.**—Father Secchi, writing to a friend in Belgium, alludes in striking terms to the remarkable connection between the magnetism of the earth and the changes of the weather. He says that the variations shown by the magnetic instruments are themselves sufficient to indicate the state of the sky. Even where there is no great movement of the barometer, following such magnetic disturbances, there are, especially in summer, changes of the wind and sometimes storms.

**DISCOVERY OF NATIVE MERCURY.**—M. Leymerie, in the *Chemical News*, writes: In the Domaine du Cros, situated in a glen opening directly into the valley of the Herault, the decayed roots of a mulberry tree were being dug up. On breaking one of them there issued from it a wave of mercury. The country people are of opinion that the death of certain mulberry trees is due to the action of mercury. The soil is of a schistous nature.







# MINING SUMMARY.

The following is mostly condensed from journals published in the interior, in proximity to the mines mentioned.

## California.

### ALPINE.

**CONTRACT LET.**—Alpine *Chronicle*, July 7: Superintendent Dennis has let a contract to Oliver Anderson, Thomas Carlson and John Rowick to run the Illinois-California tunnel 100 feet further at \$15 per foot. We are glad that work on this claim has been resumed under very favorable auspices.

**SILVER CREEK.**—The tunnel of this mine is 110 feet.

### AMADOR.

**POTOM.**—Amador *Ledger*, July 7: Operations have been commenced in dead earnest upon this mine, under the able superintendence of John Trelogan. Eight men are employed and everything wears an encouraging aspect. Indeed, the management have such confidence in the resources of this claim, that a contract has been let for the erection of a 10-stamp mill, a *fac simile* of the one now in operation at the Tallman.

**FUTURE.**—The taking out of ore is suspended for the season, until water again becomes abundant. Sinking is now the order of the day. The mill is still running, and the quantity of rock on the dump is sufficient to keep the mill running for a week or two more.

### CONTRA COSTA.

**PROGRESSING.**—Antioch *Ledger*, July 7: Work is progressing on the Empire coal railroad. Section contracts have been awarded to Tregallas, Fitzjohn and Flynn, who are each working a force of men and teams grading the road bed. Teague & Co., tunnel contractors, have penetrated the hill 600 feet and will make an opening through by the middle of this month. At the mine, work continues without interruption. A drain, 300 feet in length, is being cut, which will save lifting the water 50 feet; it will also make a saving in the amount of fuel consumed. Work upon the wharf at the foot of Kinball street has commenced, and the whole will be completed in a few months.

### FRESNO.

**QUARTZ.**—Fresno *Expositor*, July 4: Near Big Dry creek, in the foothills, southeast from Wm. Cole's place, is a spot through which a number of quartz veins permeate. The first of these veins was discovered a number of years ago, but it remained almost wholly unprospected until a portion of it, comprising what is known as the Champion quartz mine, passed into the control of F. Jensen. After spending a sufficient sum in prospecting to convince Mr. Jensen that the mine was valuable, he erected with his partner, R. M. Keyes, a small five-stamp mill. Ore from the mine crushed in the mill has yielded gold in paying quantities. These gentlemen have been engaged in sinking the vein for the purpose of working it more profitably. Mr. Lytton and others owning on another vein near by have also been sinking. They are down on the vein about 50 feet, and we learn at the bottom of the shaft the vein is two feet in width and well defined. They lately made a crushing of ore at the Champion mill, with results of the most flattering kind. The average of the rock yields about \$20 per ton in free gold. Other mines in the vicinity have had rock crushed at the Champion mill, with equally satisfactory results. From what we can learn it is evident that the mines in this neighborhood will at no distant day be worked with profit. The present great want seems to be sufficient capital to develop the mines.

### NEVADA.

**A RICH STRIKE.**—Nevada *Gazette*, July 7: We yesterday visited the ledge known as the Live Yankee, on the Half-Mile House road, and about half a mile south of the Smith ledge. It is a new discovery, but it is about the richest thing lately found in this vicinity. It is owned by R. E. Robinson, Charles Beale, James Beckwith and Daniel Holmes. The company have been prospecting at that point for some time. There is a ravine heading at a point where work has been done. The ravine below has been worked off and paid splendidly. These gentlemen concluded that the gold in the ravine must have come from a quartz vein, and so have been hunting for it. About two weeks ago they commenced a shaft and after sinking 25 feet they encountered a vein of ore 40 feet before striking anything. On Tuesday evening they struck the ledge and from five pans of dirt washed out \$26 worth of gold. The formation varies from one to four feet in width. The upper and lower portion is composed of sulphureted rock, and between these there is a body of decomposed sulphurets and yellow ochre in which is found the gold. We saw one pan worth of ore, and in which we should judge was \$5 in gold. A horn full was washed from which at least \$10 was taken. The company have out about seven tons of ore and will soon have it crushed. They have certainly struck a rich thing and are deserving of their success.

**THE PROVIDENCE.**—On the 8th level of the Providence mine a cross-cut has been run 140 feet in ledge matter, and from the heading a drift has been run to the level, any heretofore taken out. On the 600-ft level, south of the shaft 500 feet, some splendid ore is being taken. The incline is being sunk from the 8th level 100 feet lower, so as to open a new level. The rock coming from that shaft continues to improve as they go down. In short, the mine never looked as well as it does to-day.

**THE WYOMING.**—Work has been temporarily suspended in the Wyoming ledge, but a tunnel is being run to tap the Wyoming ledge.

**THE NEW ENGLAND.**—The hoisting machinery and mill of the Gold Run mining company has been purchased by the New England company, and will be in place ready for operation in a few days. It will be placed on the west side of the Grass Valley road, opposite the present hoisting works, on the croppings of the ledge. The incline will be completed ready to put down the pump this week. The rock in this mine continues to look well, and when the new works are in operation big returns may be expected.

**NEVADA MINE.**—The Superintendent of the Nevada—better known as the Soggs mine—has purchased the engines and machinery of the old Union mine, near Banner hill, and will go to work at once to have it removed and put in place at the Nevada. There are two powerful engines. One of them will be connected with the mill for crushing when water is scarce. This improvement will allow the Superintendent to thoroughly open the mine and prove what everybody knows—that it is one of the best in the district. The Providence is the south extension of the Nevada, and there is no reason to doubt that the latter is as reliable as the first.

**GRAVEL MINE.**—Dutch Flat *Forum*, July 5: The Rhode Island company continues to clean bedrock. Work in the Wide West mine is being prosecuted to good advantage with a large force of men. The gravel taken from the main tunnel and the side drifts continues to be very rich.

**LOWELL HILL MINES.**—The Swamp Angel company made a clean-up last Saturday, which turned out to be the richest made during the season, the result being the payment of another dividend. The bedrock tunnel in the Planet is being advanced at the rate of five and a half feet per day. The East New York tunnel is in a distance of 300 feet, and although somewhat wet overhead, good progress is being made in advancing it. The tunnel in the Wild Cat mine has reached a distance of over 900 feet.

**LOWELL HILL MINES.**—The Liberty Hill company turned off last week and made a general clean-up for the season, with very encouraging results.

**GEORGE SMITH'S MINE.**—Nevada *Transcript*, July 5: Active work was commenced on this mine about six months ago, and to-day it promises to be one of the best mines in this part of the State. The company worked under great disadvantages for many months, the ground

being soft and treacherous. During that time a cave occurred, and it cost \$2,500 to repair the damages, but now they have the whole mine timbered with the heaviest kind of lumber. They are down 150 feet, running a level at each 50 feet. On the first level the ledge is about six or seven inches thick, and is charged with free gold and very rich silver. From this level they have taken out some of it as specimens, and it is worth fully \$1,000. On the second level the ledge has increased in thickness, and the rock is richer than they found on the first level. On Sunday morning they struck it on the third level, and the ledge is about two feet thick, and, in the place of the other, the rock is filled with live sulphurets, and, in fact, on this level the rock will pay more money to the ton than they found on the first level. Work will be continued as fast as possible in order to run another level, when work of the most extensive character will be carried on. Yesterday morning they commenced stoping, and will take out about 150 tons of rock before a crushing is had. As soon as the other level is completed, the company expect to have sufficient backs for six months' work, without further sinking. The first lot of rock crushed yielded \$10 per ton, the second, \$22, and those who have seen that already in sight, declare it will go in the neighborhood of \$50 per ton. Old miners of the county, who are employed at this mine, and who have worked in most of the others, say it is one of the best prospects they have seen in Nevada county. The company are now employing about 25 men, and within 30 days expect to give employment to 50 more. No believe there are any number of good quartz ledges in this vicinity equal to the Providence, Geo. Smith's and others, and if the same amount of work was done upon them as has been done upon these, the fact would be demonstrated.

### PLACER.

**MINING ITEMS.**—Dutch Flat *Forum*, July 5: Our washing season is gradually drawing to a close, only a few claims having sufficient water to continue operations. The Star & Union claim has ceased washing for the season and is cleaning bedrock. The Baker partially cleaned up the last instant, and resumed washing this morning. Fowler drifts extends back 100 feet beyond the Franklin, and is awaiting the arrival of the 12,000 pounds of Judson powder, which is to be used in the blast. This claim is now working in solid gravel, and we are informed the product of the last run was very satisfactory, showing a marked improvement over the drifted ground, notwithstanding the very bottom could not be reached by the pipes, owing to the unevenness of the surface of the bedrock. We have heard of a large bed of gravel, and are pleased to learn that they are beginning to be confirmed. We feel confident that when the pit extends back to the soft gravel it will pay enormously. The exceeding hard cement lying on the front rim has retarded its opening, but that will soon be past. This claim will probably wash till about the middle of August, after which it will take about a month to clean the bedrock which has been exposed. The Franklin claim is extending its bedrock tunnel, with branches, so as to reach the face of its bank of gravel. This will greatly add to the convenience of washing. The Polar Star exploded a blast of 500 kegs of powder last week, which shook up and crumbled a large area of its bank of gravel. The claim is washing again very successfully. The Southern Cross also exploded a blast of about 500 kegs of powder last week, which loosened up an enormous quantity of gravel. These claims are supplied with water from the South Yuba ditch, and will probably continue washing about two months longer. At Gold Run everything is hung up for the season, excepting the Big Bonanza claim, which will continue to run for four or five days longer, when it also will take a rest.

**HUMBOLDT CANYON MINES.**—The Peeler & Guler company turned off last week and made a general clean-up for the season, the result of which is said to have been large. The work of advancing a tunnel to prospect what is supposed to be the original channel of that branch of the American river which passes through Humboldt, is again resumed by Peeler & Co., and will be prosecuted until the approach of another hydraulic season. Dorer Bros. & Co. are cleaning up the company and others the full width of the stream by a general clean-up, which will take until fall to complete. The work will consist of cleaning bedrock, fumes, ground, sluices and canyons, all of which is thought will pay exceedingly well.

**BLUE CANYON RAVINE MINES.**—The Rough & Ready claim, owned by Geo. Anderson and A. B. Chittie, is on Blue Canyon ravine, one-half mile from its junction with the American river, and contains the full width of the stream by 1,600 feet in length. The gravel deposit is from three to 12 feet in depth, and has been thoroughly prospected by running cuts and sinking shafts to the bedrock. The gravel extracted in this manner was washed by a rocker, through which process it paid \$2.50 per day to the man, one piece found being worth \$7.50. The rocker has now been dispensed with, and preparations are being made to put in a string of sluices, which, when completed, will add one more claim to the list of dividend-paying mines on Blue Canyon ravine. The Roaring Blunder company are extending a drift along the edge of the channel, which is said to be paying very large.

**SHADY RUN MINES.**—The Wild Yankee company have completed the work of a general clean-up, the result of which was the disbursement of large dividends. A large amount of mining timber has been got in readiness, this company will now open up and work their drift diggings until the approach of the wet season. Work in the North American mine continues to progress with encouraging results.

**SUNNY SOUTH.**—Cor. Placer *Argus*, July 7: This is a new mining settlement, six miles or so from Michigan Bluff, and within the new territory, which is about the same altitude. It contains the famous Hidden Treasure claim, the principal owners of which, I understand, are the Cameron Bros., William and Archibald, and M. H. Power. Within a year, this place has sprung into importance—there being already 18 or 20 houses, including two hotels and a store, the latter now being completed. Many of the supplies are brought in on pack animals. There are about 50 men working the claim, which is being well. The water, however, is becoming scarce, and it may be necessary ere long to reduce the working force.

### SAN BERNARDINO.

**ASBESTOS.**—Los Angeles *Herald*, July 1: About a year ago asbestos croppings were discovered in the San Jacinto range by parties from this city and San Diego. A claim was located, and nothing further was done, excepting the incorporation of a company which has since subsided, and the performance of some desultory work in the mine. Mr. F. R. Angell, of this city, and Mr. Faris, of Florence, recently proceeded to the vicinity of the former place, and took up a claim, which they have partially developed with astonishing results. Mr. Angell has returned to this city with the most remarkable specimens of asbestos ever seen. Some of them are two feet and a half long. The longest continuous fiber so far as known was only about eight inches in length. As the longer the fiber the more valuable the deposit, this mine promises to be a very important discovery. A company to work the vein will be immediately organized.

### SIERRA.

**DIVIDEND.**—Mountain *Messenger*, July 7: The Swallow company, of Colorado, declared a dividend for June, of \$200 a little over 30 cents on the \$1 investor.

**EUREKA.**—Times are rather at a standstill just now. Mr. McKay, of San Francisco, an old settler here, is back again on a prospecting expedition. Harry Baker's claim is paying well this season—the one that has yielded so richly for years. Moss & Walker had a good clean-up from all accounts.

## Nevada.

### WASHOE DISTRICT.

**SUTRO TUNNEL.**—Gold Hill *News*, July 11: Total length of tunnel last evening, 17,375 feet. The header continues in easy working ledge porphyry, with streaks of quartz and clay and regular Oostock formation. Very good progress is being made in this material, and even though the report is not true that the miners working in the

combination shaft can hear the blasts let off in the Sutro tunnel, the story will be realized before the end of another year. The course of the tunnel is about 300 feet north of the shaft, and it has to go over 1,200 feet in order to reach a point opposite.

**UTAH.**—Sinking the winze below the 1150-ft level is making the best of progress, the bottom in very favorable quartz and ledge matter.

**SIERRA NEVADA.**—The south drift on the 1500-ft level is being pushed vigorously ahead to meet and connect with a corresponding drift from the Ophir. The north drift on the 1200-ft level is being pushed ahead to connect with the Utah, the face still in very favorable ledge material.

**HALE & NORRIS.**—The water is reduced to a point 100 feet below the 1000-ft level. The water is now being hoisted by the small compressed air pump through the winze on the Savage line and carried to the water tanks, from whence it is carried to the surface. This gives the entire use of the shaft for repairing purposes.

**ORION.**—Daily yield, 40 tons of ore, keeping the Winfield mill steadily running. The dump of the main incline below the 1000-ft station is completed. A drift south from the 1000-ft level has been started and is making good progress. A station has been opened in the south winze at the 1500-ft level, and a cross-cut is now being run to determine the value of the vein. The face of this drift is in very encouraging ledge matter.

**MEXICAN.**—The winze chamber in cross-cut No. 1 on the 1405-ft level is being steadily enlarged and the ore extracted to the mill. The west cross-cut (No. 2) from this drift is at present advancing, the face in fine quartz, showing spots of fine ore.

**LEVATHAN.**—The repairs to the main shaft being about completed, work is resumed in the mine. Cross-cut No. 5 at the 600-ft level, which is being driven east from near the face of the north drift, is in very good looking ledge matter.

**SOLID SILVER.**—The east and west drifts are being pushed steadily ahead to cut the ore vein, which they must do at no very distant day.

**USION COS.**—The drift east at the bottom of the winze on the 1300-ft level is still in a fine character of vein matter, and is being steadily advanced.

**COS. VIRGINIA.**—Daily yield, 500 tons of ore. The ore stops on the 1550, 1500, 1500 and 1400-ft levels show splendidly, and the ore is being steadily advanced. The east drift on the 1700-ft level has penetrated the wall of the ledge and cut the ore vein, which at that point is quite solid and fair grade ore, although not so rich as that on the 1550-ft level further to the northward. Much trouble is experienced in running this drift on account of the great heat caused by a heavy influx of hot steam and vapor created by the hot water now being drawn off in the Best & Belcher and Gould & Curry. The west drift on the 1750-ft level at the C. & C. shaft is in a distance of 300 feet, the face still in very hard blasting rock. Sinking the double winze from below the 1600-ft level has been considerably impeded lately by a strong flow of water. The bottom of the winze is still in good ore. The west ore body on this level is showing better as the ore stops are worked further to the southward. The south drift on the eastern portion of the ore vein has been connected with the east drift from the deep winze, and is now being driven ahead, the face in rich ore. A drift is being run south on the 1550-ft level in the ore vein, which appears to be gradually narrowing down, and is only nine feet in width. Sinking the C. & C. shaft is going steadily ahead. The flow of water is still strong. The usual monthly dividend of \$2 per share, aggregating \$1,080,000, was declared on the 7th inst. The mills are all kept steadily crushing ore, and the prospects of the mine throughout are brighter now than they have been for the past two years.

**CALIFORNIA.**—Daily yield, 550 tons of ore. The ore stops on the 1500, 1550 and 1600-ft levels are all looking well and yielding the usual amounts of good ore. The lateral drift on the cross-cut No. 2 at the 1500-ft level, have been finished and will greatly aid the ore extraction in that portion of the mine. The regular monthly dividend of \$2 per share, aggregating \$1,080,000, was declared on the 7th inst. The mills are all running and crushing ore up to their full capacities and everything in and about the mine looks bright and prosperous for the future.

**JULIA.**—The east drift from the south winze on the 1500-ft level is being pushed steadily ahead to cut the east ledge and to penetrate that portion of the mine lying between the face of the drift and the Ward shaft. The location of this east ore vein has already been pretty well decided, and it is now generally conceded that if the Ward shaft had been continued 100 feet deeper, it would have cut the ledge; also that the heavy body of water recently encountered in the east drift from the 1500-ft level of the shaft came from the east ledge, and it is now proposed to soon start up this east drift and test the merits of the vein.

**GOULD & CURRY.**—Work in the face of the east cross-cut on the 1700-ft level has been temporarily suspended in order to give the strong flow of water from the face an opportunity to drain off, and in the face of the very hot, and the steam arising from it almost suffocating. Clearing the sediment from the bottom of the main incline, preparatory to resuming the sinking, is making good progress. The foundation of the new air compressor is completed.

**COLLIER-POTOM.**—The combination shaft is now down 1,405 feet. Daily yield, 35 tons of ore, the average assay value of which is \$25 per ton.

**YELLOW JACKET.**—The main drift east, cross-cutting the ledge at the 2200-ft level, is to-day in a distance of 100 feet. The material encountered continues to be hard bird's-eye porphyry, and no sign of any east wall is met with yet. The new shaft to the eastward is down 779 feet. The rock continues very hard and plenty of water is coming in.

**BEST & BELCHER.**—The advance drill in the face of east cross-cut No. 3, on the 1700-ft level, has been stopped, and the drift being driven gradually ahead, the rock in the face being quite hard, and the flow of water intensely strong and hot.

**JUSTICE.**—The east drift, on the 1150-ft level, is being pushed vigorously forward to cut the ore vein, the face of the drift in porphyry carrying seams of quartz and the bearing of a very fine character. The main shaft drift, on the 1000-ft level, is showing the ledge to be very solid, and the quality of ore good.

**OVERMAN.**—The north drift on the 1400-ft level running to connect with the Belcher mine is making steady progress, the face in hard porphyry carrying occasional streaks of free quartz.

**LUTHERAL CONSOLIDATED.**—The north drift on the 2350-ft level is being rapidly advanced, the face in favorable ledge matter. The east cross-cut near the center of the mine is showing very favorable features.

**NORTH CONSOLIDATED VIRGINIA.**—The water is all out of the shaft, and sinking was resumed last Monday morning.

**CROWN POINT.**—The south drift on the 2000-ft level, running to connect with the Belcher drain shaft, is being driven energetically forward.

**SAVAGE.**—During the first part of the week the water gained steadily on the pumps, since which time the decrease has been very rapid, so that to-day the water is reduced a little over 100 feet below the 1900-ft level.

**HOMESTEAD.**—Sinking the shaft was resumed on Saturday last. Good headway is now being made, the formation continuing to be very favorable.

**BELCHER.**—Sinking the drain shaft is going steadily forward.

**ALTA.**—The west drift from the 1050-ft station is being pushed steadily ahead, the face in hard blasting porphyry.

**STEELE.**—Sinking the shaft is making the best of progress, the rock in the bottom beginning to soften somewhat and carry a heavy body of water.

**KEYSTONE.**—Sinking the shaft is being pushed with steady vigor, the porphyry in the bottom showing evident signs of softening, with an occasional small streak of hard quartz.

**NEW YORK.**—The work of draining and clearing out the bottom of the shaft, preparatory to sinking, is being urged forward.

### EUREKA DISTRICT.

**THE MATAMORAS MINE AND FURNACE.**—Eureka *Sentinel*,

July 8: Since the settlement of the affairs of the mine, a force of men have been engaged in prospecting and extracting ore. The developments are very encouraging, and both the quality and quantity of the ore taken out warrant the company in starting a furnace, which at the present time they are making preparations to do. The old Buttercup belongs to the Matamoros, and that institution is undergoing a thorough overhauling, so as to be ready to commence operations upon the new 20-stamp receiving at the furnace about two and a half tons of high grade ore daily, all of which is packed from the mine on muleback. This is the only mode of transportation that can be used, the mountainous situation of the mine, and the absence of roads, making it necessary to employ a pack train.

**PAPAGO MOUNTAIN MINES.**—The Bullion Mine is on the southwest side of Prospect mountain. The formation is limestone and quartzite. Two shafts have been sunk to a depth of 50 feet each, exploring well-defined walls, between which the ore bodies are found. The vein matter is a quartzite gangue, and the ore extracted smelts readily and carries a high percentage of lead, besides being rich in the precious metals. The location embraces 1,500 feet of surface ground. The Western side of the Bullion on the southwest, and embraces the same amount of surface ground. The lode is traceable on the surface for quite a distance, and a shaft is sunk on the croppings to a depth of 60 feet. The lode is eight feet wide and uniform in size from the surface to the bottom of the shaft. A tunnel has been started on the slope of the mountain that will take the lode at a depth of 300 feet, and when its completion, facilitate the extraction of ore. Both the above mines have yielded some very high grade ore, and are among the valuable properties in that vicinity.

### WARD DISTRICT.

**STARTED UP.**—Ward *Reflex*, July 5: On Friday last one smelter and cupel furnace of the Martin White company started up. The result to date is 12 bars of bullion from the cupel furnace, which will be put through again. Litharge is what they are after particularly at present, so it is not surprising the bars do not exceed 300 in fineness, ores rich in lead taking the preference. Mr. Smith, who has charge of the cupel, says at least \$10,000 in fine bullion will be ready for shipment by Monday, so it can readily be seen the product of even one furnace will be greatly in excess of the above each week, when ores rich in silver are smelted. When an abundance of litharge has been secured, a far different result may be looked for. Possibly \$25,000 or \$30,000 in fine bullion will be produced weekly when both furnaces get down to their work. Preparations for starting the other furnaces are now being made. The result so far can be said to exceed expectations, all things considered. With a number of these furnaces in operation, Ward would not long remain in the background, but would come prominently to the front. A few weeks will decide now more than the past year has done.

## Arizona.

**MOHAVE.**—Arizona *Miner*, July 7: The latest advices from Mohave county are of the most flattering nature. The McCracken company have thousands of tons of ore upon their dump. The Greenwood mill is pounding away upon ore from this mammoth mine, and the result is that the company are shipping \$30,000 per month. Preparations are being made for the erection of a new 20-stamp mill to be put up on the Sandy. The Leet company are also owners on this celebrated bonanza, and have a new 10-stamp mill well nigh unto completion. The Mineral Park people are also prospecting and opening the many valuable mines that exist in the immediate vicinity of this healthy, growing town. Then the Hackberry mine and mills are doing a good work. The shipments from the Hackberry mine are of such a nature that the mineral capacities of the lode to be of a superior character.

In Yavapai we have the Black Warrior, Prince, Kit Carson, Tip-Top, Swilling and many leads that are producing ore of an incredulous high grade, much of which is being shipped to San Francisco for treatment. The Peak is working away as usual, producing about \$40,000 per month, which will be increased to at least \$100,000 per month as soon as their new mill is erected, now within 25 miles of the mine.

The Zidias and Miriam lodes, owned by Dr. Day, Jay G. Kelly, A. O. Noyes and Hon. Thos. Fitch, are attracting much attention from the mining men. In Turkey Creek, the Oodwin mine is producing excellent high-grade ore and the lead shows a face of ore 10 feet wide. Other mines in that district show equally good with the Goodwin.

In Bradshaw, Luke's mill is ready to run ore. From the Black hills, north of Prescott 30 miles, miners report very rich silver and gold ores, and many hardy prospectors are tearing the tops from the various quartz croppings that exist throughout the whole of that section. Many new locations have been made since last week, and we learn that some are considered valuable.

## Colorado.

**EAGLE BIRD.**—This mine furnishes employment for nine men on three different leases. The main adit is now in a distance of 400 feet, and a shaft 150 feet deep has been sunk from this level.

**EAST BAXTER.**—This mine has been closed, but work has been resumed. A winze is under process of sinking on the 113-ft level; when this is completed a drift 60 feet long will connect it with the foot of the engine shaft, which will answer the double purpose of opening up ground and thoroughly ventilating the mine.

**THE LITTLE ANNIE.**—This is the name of a lode discovered on the 15th of May, two miles north of Mill City, on the Fall River, north of the property of Thos. McCunniff and B. F. Napheys. It carries 18 inches of mineral.

**RED BIRD.**—This lode on Republican mountain is cut by a tunnel 100 feet long, which is continued to the north wall, making a total length of 130 feet. The ore shows black sulphurets, brittle silver and blue carbonate of copper.

**AT THE SNOW DRIFT.**—Messrs. Meyers and Martincourt have taken a lease on and are putting in a tunnel to cut this lode. The tunnel has been run in a distance of 80 feet.

**AMAZON.**—J. Mackintosh, J. Rey, David Hill and Ed. Kane are the owners of this lode on the east side of Cherokee gulch. A large, substantially-timbered tunnel cuts the Amazon lode at 80 feet from its mouth, and at an angle of about 45 degrees.

**EAST DIVES.**—Messrs. Sanders and Fountain have this end of the mine leased, and the former informs us that they are employing a force of 15 men, who have been doing considerable dead work recently, putting in two drift east—on the 400-ft and the 800-ft levels—besides six miners who are constantly on the 800-ft level, where they have a vein of mineral varying from three to ten inches in width, which averages about 175 ozs. per ton.

**S. J. THILES.**—We have another fine run to report this week from this lode, the property of the Marshall silver mining company, Messrs. Bruce & Co., lessees.

## Idaho.

**GOLDEN CHARIOT.**—Owyhee *Avantache*, July 7: Work at the Golden Chariot is progressing favorably, preparatory to sinking. The machinery is being overhauled and placed in thorough condition. Contracts have been awarded for sinking the shaft to a depth of 300 feet, so that Mr. West is to retain his position as foreman. The Minnesota works will be brought into requisition in the disposition of the water. There is a general feeling of hope that the work now being so auspiciously begun in the Chariot will lead to developments that will open up a brighter era than ever for Owyhee, and we are sanguine that such will be the result.

At the Empire, operations are progressing very favorably, and the mine is looking remarkably well in every direction. The slopes are yielding a good supply of rich rock, the crushing from which bids fair to exceed the most sanguine expectations of all interested. Altogether, a handsome clean-up may be expected from the rock now



### Sebastin—A New Safety Dynamite.

An improved nitro-glycerine compound has been invented by Mr. Gustaf Fahnehjelm, of Stockholm, the chief modification being that the second main ingredient is charcoal produced from a special wood, and selected and prepared in such a manner as to be able to absorb and solidify the greatest possible quantity of nitro-glycerine. In order to render the combustion more complete, and to augment the rapidity of the explosion, a small quantity of nitrate of potass, or other suitable salt, is added to the mixture of the two ingredients above named. The London *Mining Journal* says Mr. Fahnehjelm is aware of the existence of patents for explosive compounds in which nitro-glycerine and wood charcoal are mixed with explosive salts, and especially with chlorate of potass, but in those compounds the salts are applied in large quantity, and serve as the chief base of the compound, while only a small proportion of nitro-glycerine is added, and only for the purpose of igniting and exploding the compound. This new compound thus differs from the ordinary dynamite, in which the nitro-glycerine is absorbed by the infusorial earth, in that the solidification of the oil is effected by the aid of an active base—charcoal of a special kind; and it differs from other explosives, firstly, by reason of the application of the charcoal of a special kind, which is able to absorb from five to six times its weight of nitro-glycerine; secondly, by reason of the proportions of the substances, which will be explained further on.

In the ordinary dynamite, the infusorial earth cannot keep and retain the oil absorbed under certain circumstances. When such a dynamite is exposed to changes of temperature, and especially when it has become frozen, and then passes into the pasty state again, a part of the nitro-glycerine becomes separated from the mixture. The danger resulting therefrom is not greatly to be feared if the nitro-glycerine is absorbed by a charcoal of the kind used in the improved process here in question. In order to produce a charcoal having the required qualities, the carbonization or coking must be done in such a manner as to completely destroy the organic substances, and to produce as porous a charcoal as possible. For this he selects by preference young trees or stripplings, or branches of poplar, hazel wood or alder tree, and he burns them in an open fire. When the wood has been consumed he does not put out the fire by means of water, but leaves it to go out of itself. In this way he obtains a very inflammable and very porous charcoal, which can absorb more than five, and approaching six times its weight of nitro-glycerine without any risk of the separation of the oil. The charcoal is pulverized in a wooden mortar, but it should not be reduced to too fine a powder, else it will not so completely absorb the nitro-glycerine. The charcoal produced in the ordinary way, or by closed fire, is quite different as regards absorbing power. Charcoal of fir trees may, however, be used, and may acquire nearly the same qualities, that is if charred a second time in a special oven.

By mixing the different kinds of charcoal a material may be obtained possessing the required absorbing qualities, and an explosive compound may then be obtained of the required power without loss of the necessary consistency—that is, without being too dry, which is not desirable. The charcoal not only serves as the best absorbent for the nitro-glycerine, but it plays also an important part in the combustion. The nitro-glycerine in exploding decomposes into steam, carbonic acid, nitrogen and oxygen. In the explosion of dynamite with inert base the oxygen goes away without being utilized, but in the explosion of this new compound (the new sebastin as he calls it) a part of the absorbent charcoal is burnt by means of the liberated oxygen. The quantity of gas is thus augmented, and also the development of heat, whereby again the tension of this gas is augmented. As, however, the quantity of charcoal necessary for the complete absorption of the nitro-glycerine is in all cases much larger than that which can reduce the excess oxygen produced at the explosion into carbonic acid, he adds to the compound a salt, which also by the combustion gives an excess amount of oxygen, which may contribute to burn the rest of the charcoal. For this purpose he uses by preference nitrate of potass, which may be added without any risk, and which gives the explosive compound a very much greater rapidity or vehemence, and consequent force of explosion.

The composition of the new sebastin depends upon the objects for which it is to be used, and the effects intended to be produced. The strongest compound, and even in this there is stated to be no risk of the separation of the nitro-glycerine, is composed of 78 parts by weight of nitro-glycerine, 14 of the wood charcoal, and 8 of nitrate of potass; and when less power is required the proportions are varied, the second quality consisting of 68% by weight of nitro-glycerine, 20 of the charcoal and 12 of nitrate of potass. To show the relative strength of the compounds, the inventor says: Let the dynamic force of pure nitro-glycerine be represented by the number 2,884,043.6, then the dynamic force of sebastin No. 1, as above, will be indicated by 2,416,575, and of the sebastin No. 2 by 1,933,079.4, while that of dynamite No. 1 (consisting of 75% of nitro-glycerine and 25% of infusorial earth) will be

represented by 1,674,694. For the above qualities of sebastin the increased effect produced by the greater rapidity of the explosion must be taken into account also. The increase has not yet been measured, but it is estimated at 10%. The sebastin may also be compounded in other proportions of the constituent parts, but the object being to produce explosive compounds of the greatest force which it is possible to employ without danger, he merely mentions that the proportion by weight may vary from 50% to 80% of nitro-glycerine, 15% to 35% of the prepared charcoal, and 5% to 20% of the nitrate of potass.

It is to be distinctly understood that Mr. Fahnehjelm does not claim the combination of nitro-glycerine and wood charcoal in general, but the production of a solid compound of nitro-glycerine and a wood charcoal prepared in the special mode or modes set forth, the nitro-glycerine being the principal ingredient which is absorbed by the wood charcoal to the extent of more than five and reaching nearly six times its weight without risk of this compound parting with any of its oil as set forth; and secondly, the addition to such solidified nitro-glycerine of a quantity of nitrate of potass, or other suitable salt, not exceeding 20% of the whole mass, for the purpose of rendering the combustion as complete as possible.

### Kentucky Ridge Mine.

This mine, says the *Grass Valley Union*, situated on Deer creek, one mile from Randolph Flat, is one of the new mines of this district but is rapidly coming into prominence as a good mine. On Friday our reporter went down with the Superintendent of the mine, Mr. Joseph Snyder, to take a look at things, and with Mr. Snyder's assistance managed to get a pretty good idea of what had been done there. The ledge was discovered about a year and a half ago by three Rough and Ready men, who sunk a short incline on the ledge and took out some rock, but were finally compelled to stop work on account of water. What rock they were able to take out prospected well. A crushing taken out at the croppings, milled \$18 per ton, and at the bottom of the incline it yielded \$40 per ton. But not having money to put up the necessary hoisting works, the company was compelled to suspend operations, and becoming discouraged they finally sold the mine to Mr. Snyder. This gentleman organized a company, incorporated, and immediately commenced work in a systematic manner. About three months since tunneling was commenced, and after running a short distance the ledge was cut, and drifts were run preparatory to taking out quartz. The drift toward the east is in 154 feet, and that to the west 260 feet. In the drifts the ledge ranges from 18 inches to three feet in thickness, and is full of gold. A second tunnel was started, for the purpose of cutting the ledge at a greater depth. This tunnel is now in 220 feet, and has 125 feet further to run before it cuts the ledge. For the present work in the lower tunnel has been suspended, on account of hard rock, until the mill is completed, when an air compressor and Ingersoll drill will be put in. And this reminds us of the mill. About five weeks ago, work was commenced on the buildings for the mine. The boarding-house is already running, an office and a blacksmith shop erected, and the mill is progressing rapidly. It will at first consist of eight stamps, with room for 40, and be run by a 31-foot overshot wheel. Water for the wheel is plenty. A dam has already been put in across Deer creek, three-fourths of a mile from the mill, and the ditch is dug. The mill will be running by the middle of the month. The dam is as perfect a structure of its kind as can be found anywhere. It is made of large hewed timbers firmly anchored to the granite by heavy iron rods, in such a manner that no freshet can possibly carry it away. The ditch is protected by a break-water, seven feet high. A sand gate is provided at a greater depth than the mouth of the flume, so that there will be no danger of the ditch being filled up with sand. We can in this article give but a meager idea of what has been done at the Kentucky Ridge, but feel safe in saying that before the end of another month the mine will be able to speak for itself.

"SLICKENS" A GREAT BENEFIT.—The *Chico Enterprise* states that the lands around Nelson, Butte county, which were covered with the debris of "slickens" from the mines of Cherokee, and which were condemned as worthless three years ago, for which the Cherokee company had to pay a high price to the owners as damages, were put under the plow last year, and this year have yielded a crop equal, if not superior, to any in that section. Thus the mining company has gained considerable by the ultimate purchase of the land. It appears that the mixing of the debris from the mines with the adobe soil is a benefit instead of an injury, as it makes it free and easily worked. There are many other instances where lands have been benefited by the "slickens" overflow from the mines. The *Bee* says: The wash from the mines is full of enriching qualities and might be used to great advantage upon the clayey or adobe soils. There is nothing more fertile than the soil taken from the American river, at its junction with the Sacramento. It is as rich as barnyard soil, and more desirable in some cases. If farmers would utilize the "slickens" instead of abuse them, they would find in them an ever present and reliable friend.

### Profits of Smelting in Utah.

The product of lead in Bingham canyon is a matter of serious importance to this Territory, as that camp sends out nearly one-half the lead produced in Utah. While the mineral bodies in Bingham are unprecedentedly large, unfortunately the ore runs comparatively low in silver, and the mines in this district are therefore more seriously affected by the depressed state of the lead market than those of any other camp in the Territory. On the other hand, the Cottonwood ores run higher in silver, but they lie in small veins or bodies, and the work of extraction is more expensive in this district, as a rule, than in Bingham; hence the low price of lead affects both camps about equally. But Bingham furnishes the greater quantity of ore. The Old Telegraph, Revere, Yosemite, Winnamuck and Spanish, besides numerous small mines and jiggers, all produce lead ore, though not as much as they could did the market demand more. Yet the producing capacity of this camp avails us nothing, as it is absolutely impossible for any man to produce and sell hullion in this Territory for less than \$65 per ton. The lead standard on which ores are purchased here is 35 per cent, and even at that our small mines can hardly be kept open. The average ore will not run as high as 45 per cent. In lead, so that the miner, who gets 50 cents per unit for each unit above the standard of 35 per cent., will realize not to exceed \$5 per ton on his ore for the lead it contains. The cost of getting ore to the smelters from the best managed mines in Bingham is for each ton, \$6.00; freight, \$3.25; sampling, \$1.25; interest and wear and tear, \$1.50; total, \$12.00. The cost of getting one ton of lead ore to the smelter being \$12, and the miner having realized but \$5 for the lead his ore contains, he is obliged to make up the deficit of \$7 in the cost of producing that one ton out of the silver the ore contains.

The smelter purchases lead ore from the miner on a standard of 35%, paying the market price for the silver it contains and 50 cents per unit for each unit of lead above the standard. It requires to produce one ton of hullion two and a half tons of ore, for which, allowing it to contain 45% lead, the smelter pays \$12.50; the cost of smelting a ton of hullion is \$50, allowing a loss of 10% in the process, and the wear and tear of machinery and interest on the money are estimated by all our mining men at \$2.50. That is, the final cost of turning out one ton of hullion at one of our smelters is \$65. The present rate of freight from Utah to New York is \$32.50. On the arrival of the bullion at its place of destination, it must be desilverized, a process which costs the bullion producer \$16, and is accomplished by a loss, to be borne by himself, of 4% of the lead, with 50 cents per ton brokerage. After desilverization, the hullion producer has 1,920 pounds of lead in New York ready for the market, which at six cents per pound he would realize on the sale \$115.20, with a profit of \$1.20 per ton.

#### RECAPITULATION.

Bullion, 1,920 lbs., at 6 cents.....	\$115.20
Ore 2½ tons.....	\$12.50
Wear and tear on smelter.....	2.50
Smelting.....	50.00
Freight.....	32.50
Desilverization.....	16.00
Brokerage.....	50
	\$114.00
	\$114.00
Net profit on one ton.....	\$1.20

If this profit were always sure, and the supply of lead ore unlimited beyond question, the smelting business would pay, and Bingham miners would be happy; but when the price of lead drops the fraction of a cent in price, the smelting business in Utah gets "sick," as the miners term it. But as a matter of fact, the average lead ore does not run above 40% in lead, which is a condition that greatly increases the cost of fluxing, and hence the cost of bullion is proportionately increased. The large bodies of carbonate ore in the Bingham mines are nearly worked out, but below the water level the sulphuret ore bodies are immense, and need only cheaper fuel and lower freights to allow of their being worked.

The smelters of Sandy and Beaver shipped to Salt Lake City during June nearly 1,373 tons of bullion; and the Chicago smelter, of Tooele county, nearly 210 tons, but only 1,276 tons have been forwarded out of the Territory, together with 780 tons of ore. Mr. Geo. Y. Wallace has nearly 40 carloads of hullion stored in his warehouse at the depot in this city; about 30 carloads are piled up in the depot yard, and at all the smelters in this county there are from five to twenty carloads stacked up awaiting the reduction in the price in freight. Without being able to get exactly at the figures, it is estimated by some of our producers that we have in this market about 1,000 tons of lead to be shipped when the price will allow. On the whole, the product has fallen off during the past month about one-third.

DRY ROT.—The best preservative against dry rot is the following of Mr. Schwartz, who made millions by it, and by whose recent death the secret was revealed: One part oil of cassia, one part wood tar and one part train oil; apply three coats on the reverse sides and on the ends of planks, floors, etc. In all probability oil of cassia played the chief role as preservative. *Am. Jour. Pharm.*

### Extensive Development of the Yorkshire Coalfield.

In no part of the kingdom have the mineral deposits been more extensively tapped and developed than in the West Riding of Yorkshire, and this process is still going on almost as rapidly as ever. In 1855 the entire quantity of coal raised in Yorkshire was 7,747,470 tons, and in 1875 it had increased to 15,855,990 tons, having more than doubled in about 20 years. From the number of new collieries recently opened out, and those in course of sinking, it is evident that the progress made during the past 20 years will now be greatly exceeded. In 1872, when the price of coal advanced very much and consumers began to fear that there was about to be a famine, there were 441 collieries in Yorkshire, but after that time, by private enterprise and limited liability companies, the number rapidly increased, so that in 1874 there were 521, and in 1876, according to Mr. Wardell's report, just issued, 539. In the intervals between the periods named, many small collieries were closed, and the actual number of new ones commenced would be at least 140 or 150. According to the report for 1876, when it was written there were no less than 112 collieries in the course of sinking, but since then several have been opened out, and will be the most extensive in the entire Midland field. In the Barnsley district alone the Silkstone coal has been won by the Barrow Hematite company, and the produce before long will be 1,000 tons a day. The same seam has also been reached in the Rockingham colliery, and that at Hoyland, where the output will be about the same, to say the least. The nine feet bed has been reached at Carlton Main, Corton Wood, Mitchell's Main, while a five feet seam has been tapped by Mr. Fossick, near to Hemsworth. The productive power of all these collieries, when in full operation, is estimated at not less than 2,000,000 tons a year. In addition to the above, there are several other collieries being sunk to the thick coal in the same locality. In the Bradford district, where the seams are rather thin, in 1876 there was in the course of sinking five new collieries; in Dewsbury, eight; Halifax, seven; Huddersfield, ten; Leeds, 28; Pontefract, five; Rotherham, seven; Sheffield, 20; Wakefield, 14; etc. The fact of so many large mines being opened out in Yorkshire alone, that will add, if necessary, several millions of tons annually to the present production, must do away with any ideas as to there being a dearth of coal for many years to come, the question to be solved being as to where markets are to be found for what is being raised. With such a superabundance of coal there is no fear of prices advancing, the probability being the other way.—*Sheffield Telegraph.*

### The World's Fair of 1878.

The latest notes of the progress of the Paris universal exposition of 1878 we find in the *Polytechnic Review*, translated from a French paper: While the East is aflame with the furie of war, France steadily continues in preparing the pacific work which is intended to render illustrious the year 1878. The work of the exposition advances with rapid strides. The Trocadero, despite the delay caused by too lightly conceived plans, has risen above the first story; in six weeks the general commissioner, whose energy has repaired the errors of his lieutenants, will have all the floor timbers and rafters in position; the iron framing has been accorded to the house of Joly, of Argenteuil.

In the Champ de Mars, the great work of the four pavilions at the angles is finished; the same is true of the palace of fine arts, which is to occupy the center position. The constructore charged with the metallic covering, the house of Cail, Creuzot, the factory of Fives-Lille, MM. Eiffel et Cie. have erected their trestle work and their rolling scaffolds. These four houses are superintending the construction of the four great galleries which unite two and two the pavilions at the angles; their framing and platform are mounted on wheels and placed on car tracks so that they can be readily moved along as the work progresses. Besides this work, all the underground water and gas pipes, ventilating flues, etc., are in position.

The question of the bridge of Jena has been settled very simply by an enlargement obtained by the help of metallic brackets; the execution of this work is intrusted to the house of Joly, as is also the construction of the bridges at the Billy and Orsay wharves. The greatest animation reigns in the timber yard, and it is well that it is so, for it is absolutely necessary that the work should be pushed forward as rapidly as possible, for it is already feared that the buildings now under way will be insufficient to accommodate all requirements. For group six (implements and products of the mechanic industries) a covered annex of 25,000 meters in length has been constructed on Bourdonnais avenue on the bank of the Seine, and on the Billy wharf. These constructions should effectually silence those who have been constantly predicting the non-completion of the buildings in time for the opening of the exhibition. The people have responded most enthusiastically to the appeal of the government. The demand for space, in the French section, not comprising the fine arts and agriculture, exceeds 26,000, and in group six, before referred to, exceeds 112,000 meters, of which the administration can supply but 36,000, which will be filled with the most choice of the national industries.



## Aurora and Bodie Districts.

Judge McClinton, who returned from a visit to the Bodie mining district a day or two since, says the Carson *Appeal*, puts us in possession of the following valuable facts in relation to that interesting region: The Standard mine, which is developing so splendidly, is situated on what is known as Bunker Hill. The mines have been known—or rather, they have been visited—for about 20 years. Many of our readers who date back to the early days of California will recollect the Kern river excitement. That was in 1857, or thereabouts. That was a failure in the gold finding way, but it led to the discovery of the Meno mines, or more correctly it led to the finding of some placers near where the Bodie quartz mines are now opening. Bodie himself fell a victim to his venturesomeness. He was frozen to death near the mining camp which now bears his name. The town of Bodie is about ten miles southwest of Aurora. The Standard mine is some 9,000 feet above the sea. It was formerly known as the Bullion. It was discovered many years ago, as we have intimated. After being frequently located, abandoned, jumped and re-located, it has finally come into possession of Daniel and Seth Cook, of San Francisco, and their associates, among whom are John B. Boyd, George W. Storoy and at one time Col. Charles W. Tozer. This mine is showing wonderfully. The ore now being extracted is that which is taken from the winzes between the 200 and 300-foot levels. There has yet been no stopping. There is every indication of an unbroken body of pay ore throughout the entire extent of the ledge. This ore assays all the way from the lower grades, say \$35 or \$40 per ton to \$1,300, and there is a large body of ore which assays as high as \$6,500 to the ton. The metal is mostly gold, the proportion of silver being very small. The Syndicate mill and mining company are working these ores in their mill. The ore is perfectly tractable and works freely by ordinary mill process. The Standard company's new 20-stamp mill will be completed by the 10th of July. At present there are 65 miners at work there. Tamarack timbers are being obtained from a distance of 15 miles from the Sierras. There is not a drop of water so far with which to contend. The lode lies in fine porphyry. The Syndicate company also have a mine in the same district. Fred. Bechtel, late of Aurora, and Henry G. Blaisdell are located there. It is Judge McClinton's opinion that these Bodie mines are going to prove very rich. His opinion seems well founded. The Cook Brothers, who are the principal owners in the Standard, feel assured of their fortunes. The appearances justify the opinion that they own one of the very best mines on the coast.

Here in Aurora (where, in 1861-2-3-4, millions of dollars were taken out of the mines, and in no instance were the mines opened and developed to any depth) there are daily new faces seen on the streets. Some are already making arrangements for prospecting and further developing the long abandoned mines of this district. Capital is all that is required here to astonish the entire Pacific coast with the amount of gold and silver that these mines can be made to produce with the aid of enterprise and energy to push ahead.

## Colorado and Poor Men.

Colorado is the paradise of the poor man. This is especially true if the poor man happens to be a miner or prospector. He is bothered by no "proud man's contumely," for our native aristocrat knows full well that the man he meets "with buckskin patch conspicuous on the rear" may possibly the next week be a millionaire. The miner also has another advantage over the poor laborer in the Eastern States. The field of his labor is under the ground, far away from the sight of man. He has a nice cool place to work, where no proud passer-by can have a chance to scornfully look at him as an inferior being. The work he has to do, when his hands are skillfully trained, is easy, and there is an excitement about it that makes each day interesting. If the vein is large and rich he feels conscious of his importance, for he knows he is unlocking nature's strongest safe and taking therefrom coin for all people and adding to the wealth of the world. If the crevice happens to be narrow and the ore poor he works with the hope of its getting better. Therefore whether in "poverty's vale or abounding in wealth" his labor is lightened by a pleasing excitement which hastens the close of day and cheers him on to the end of the week.

Compared with the common outdoor laborer in most of the Eastern States he is a prince. If he be a true man, with honest heart and clear head, he has a hundred chances here of becoming a prince in fact, where he would have hardly one in the East.

We have room here in Colorado for many more men who are not afraid and who know how to work. The oldest districts have not yet been thoroughly prospected. In this the very oldest, within the past year, new lodes have been found which now daily produce thousands of dollars, and are admitted to be the most profitable mines in the whole country. Other portions of the State present equally tempting inducements to the laboring man. These and other good reasons which we might mention, induce us to say to the honest laborer of the East—come to Colorado.—*Miner*.

## Useful Information.

## How Coffee is Adulterated.

Professor S. P. Sharpley, the State Assayer of Massachusetts, is making some analyses of articles of food, which are resulting in interesting disclosures. Package coffee has engaged his attention, but he has found very few traces of the berry itself. The following are some of the results of his examination:

"Hayward and Co.'s French breakfast coffee," the label of which sets forth that only three-quarters as much of it need be used as would be required if ordinary coffee was employed, is found to contain no coffee at all, but to be made of green peas, burned molasses and "an occasional grain of rye."

A package of "Pure roasted and ground Cape coffee" was found to be made wholly of peas and nutshells, the latter floating when the mixture was put into water.

A package of "Kimball's first quality Mocha and Java coffee" also contained no coffee at all but was made of peas and rye.

"Glinee's extra quality French coffee" was almost destitute of any foreign substance, peas and rye predominating, with a few oats.

"Chase's English breakfast coffee" is a large consumer of peas, the traces of coffee being so slight that the assayer pronounces them accidental. Happily the analyses have not disclosed the presence of any positively injurious substance, and if people who can easily find out the cost of a pound of green coffee, expect to buy a like quantity roasted and ground for half the price, they deserve to drink weak pea soup. For detecting adulterations the following rules are given:

Take some cold water in a glass and throw upon it about half a tea-spoonful of the coffee to be tested, stirring it around so as to wet the grains. Pure coffee will float and scarcely color the water. Beans and chicory sink to the bottom. Chicory colors the water at once, beans more slowly. Test the part that floats by chewing it. Coffee will thus be recognized by its taste. Nut shells, which also float, are hard and brittle. A species of nut which has lately come into use strongly resembles coffee when ground up, by floating on the water as well as by its feeling between the teeth; but the difference can easily be detected, because the adulterating ingredient is nearly tasteless. After subjecting the suspected article to the above test spread some of it on a sheet of paper and examine it carefully for grains of rye, oats and peas. The pea ingredient will frequently be found in pieces one-eighth the size of a pea and the rye in half grains. Chicory is tough when taken between the teeth and has a bitter taste, different from the bitter of coffee.

Another article which has been looked into is cream of tartar in packages. Much of it contains no cream of tartar at all, but is composed of acid, phosphate of lime, starch and gypsum.

As to the roasted peas and rye which are sold instead of coffee, it is pretty certain that they are more wholesome than the fruit of the coffee plant, being destitute of any narcotic quality; but the thing is a fraud, and it would be better for families—cheaper at least—to roast their own peas and make their own weak pea soup. As to chicory, it is well known that at the restaurants in Paris and other French towns all the coffee served to customers is largely adulterated with the roasted root of that plant, which is cultivated for that purpose.

## Creosoted Timber.

Mr. Edward R. Andrew, of Boston, has leased a large tract of land from the Boston Wharf Company in South Boston, for the purpose of erecting thereon works for creosoting lumber. The impregnation of the pores of wood with creosote for the purpose of preserving it from decay and the attacks of insects, especially the teredo or naval worm, which is also destructive to shipping, wooden piers, piles, etc., in certain localities, was first commenced in England in 1838 by Mr. Betbell, who discovered the efficacy of creosote, and erected works for treating wood with it. At first it was used for sleepers for railways. Its introduction was naturally slow at first, but as its advantages became known its use was gradually extended, until now there is scarcely a railroad in Great Britain or on the continent where creosoted ties are not used. Wood whose pores have been thoroughly impregnated with creosote will resist decay. The treatment with creosote was attempted in Boston some years ago, but the works were insufficient for the purpose, having been put up for another use and altered over for creosoting. Yet the timber creosoted at that time, although imperfectly treated, has, in most cases, given satisfaction, and is to-day, after five or six years' test, according to the Boston *Post*, perfectly sound, as can be seen in a portion of wooden pavement on Columbus avenue. At the French exposition of 1867 sleepers were exhibited which had been in wear on English roads since 1838, and yet were perfectly sound. The plant Mr. Andrews has ordered from the Whittier Machine Company. The principal tank or receiver in which the wood is to be treated is to be of one-half inch iron, cylinder 100 feet long and six feet diameter, and warranted to stand a working pressure of 200 lbs. to the square inch. This receiver will hold nearly 26,000 feet of lumber. The works will be completed about August 1st.

## Disinfectants.

The commission appointed by the Academy of Medicine of St. Petersburg, to study the effect of the different antiseptic substances and disinfectants so-called, came to the following conclusions, which are printed in the *Annales du Genie Civil*:

1. Carbonic acid is most efficacious in preventing the formation of ammonia, and the development of inferior organisms by the decomposition of organic matter; it is, in consequence, the best antiseptic.

2. Oil of vitriol, the salts of zinc, and charcoal are the most active for neutralizing the foul odors originating from putrid matter.

3. The powders of Prof. Kitzky, together with the properties which they possess in common with other carbonated disinfectants, attracted attention by reason of their isolating the phenol and the quick-lime which enter into their composition. These absorb moisture, as well as the gases which are formed by decomposition.

4. Chloride of lime and permanganate of potassa act promptly in destroying the inferior organisms found in putrid liquids.

5. These disinfectants retard, in a measure, the development of putrefaction in organic matter, but their influence is but momentary. As regards the purification of apartments, their influence is but feeble, if not totally ineffectual, by reason of the small degree of concentration of their elements, and are also little employed on account of their influence on the health of the occupants.

6. For buildings not inhabited, chlorine and nitrous acid are the best disinfectants that can be employed.

A WARNING.—He who champions the cause of the workman, falls far short of his duty if he fails to warn him against one terrible common enemy, the liquor saloon. If you are not a temperance man, there is all the more reason why you should look this subject fair in the face. The saloon is not an industrial concern. It neither feeds nor clothes you. It adds neither to your comforts nor enjoyments. It is a trap placed upon nearly every corner, to catch your money without giving a profitable return. It absorbs a portion of your earnings, and leaves you none the better for it, but very likely much the worse in morals, health, pocket and self-respect. You know that this is so if you stop to think. The seeds of numberless evils and none whatever of good to mankind grow in these hot-beds of corruption. We beg our friends, the workmen, to avoid liquor saloons. If you can find no other society nor place of resort, you are indeed unfortunate; but better none than such as thus lowers your manhood and your purse.—*Cal. Agriculturist*.

## GOOD HEALTH.

## Treatment for Lead and Mercury Poisoning.

Our workers in lead and quicksilver will be interested in the following, from *Iron*: To a Belgian professor, M. Melsens, the Paris Academy of Sciences awarded, last April, the prize of £100 founded by M. Anget de Montyon to encourage the invention of processes for diminishing the risks of unwholesome trades. This prize was decreed to M. Melsens for his method of curing and preventing lead and mercurial poisoning. The report of the committee appointed to examine into M. Melsens' process is as follows:

Thirty years ago Prof. Melsens pointed out iodide of potassium as a means for successfully combating the ill effects of lead or mercury on the human body. Experiments undertaken in conjunction with Prof. Guillot confirmed the results first obtained by M. Melsens, who has since for a long period been pursuing his investigations and experiments.

Considering saturnine or mercurial affections as being due to the presence of metal in the organs which are the seats of those affections, M. Melsens administers graduated doses of iodide of potassium. The noxious metals are, by the action of this drug, carried away in the urine in the form of double soluble iodides. M. Melsens also advises the use of the iodide of potassium as a preventive in cases where men are exposed to the effects of lead-dust or mercurial emanations.

Numerous experiments in the course of 30 years have proved the practical value of this system of treatment. Workmen affected with lead paralysis have been cured; others, who were unable to follow their calling from their liability to saturnine colic, have been enabled to take it up again, fortified by a regimen of which a dose of iodide of potassium formed part. The result of the observations made at Brussels and Lille, and the letters and certificates sent to the Academy, leave no doubt on the point.

With regard to mercurial affections the observation made by M. Melsens in person have been confirmed by those made at the mercury mines at Idria. The workmen engaged in the manipulation of mercury and mercurial products at the Idria mines have been made the subject of various methods of treatment, curative or preventive, and the good effects of the iodide are no longer doubted of.

At a special hospital in Vienna, ample occasion has been furnished to watch the action of the iodide in freeing the body from the presence

of fixed mercury and preventing its fixation. It has been found that in presence of the drug the symptoms characteristic of the mercury are removed or diminished, or prevented from declaring themselves.

The action of the iodide of potassium, according to M. Melsens' idea, is a purely chemical one. It consists in determining the metal rendered insoluble by the formation of some albuminous compound to take on a soluble form by the creation of a double iodide removable *per viam urinariam*. Whether this is the case or whether its action consists in determining by destruction the evacuation of the morbid tissues containing the fixed metal, it is not the part of the committee to determine. It is sufficient that the author of this process has fully succeeded in diminishing the danger of certain mining and manufacturing operations.

## Sun-stroke.

Sun-stroke is rare on this coast, although last year and this a few cases have been reported. The heat is liable to return for brief intervals, and it would be well to know how to guard against prostration, or how to treat it if it comes. The Board of Health of New York city has collected some information upon this subject, in the form of a circular. Copies have been printed in English and German, which the *Tribune* says are to be circulated through the city very soon, especially among the laboring classes. The following is the principal part of the report:

Sun-stroke is caused by excessive heat, and especially if the weather is "muggy." It is more apt to occur on the second, third and fourth days of a heated term than on the first. Loss of sleep, worry, excitement, close sleeping room, debility, abuse of stimulants, predispose to it. It is more apt to attack those working in the sun, and especially between the hours of 11 o'clock in the forenoon and four o'clock in the afternoon. On hot days wear thin clothing. Have as cool sleeping rooms as possible. Avoid loss of sleep and all unnecessary fatigue. If working indoors, and where there is artificial heat—laundries, etc.—see that the room is well ventilated.

If working in the sun, wear a light hat (not black, as it absorbs the heat,) straw, etc., and put inside of it on the head a wet cloth or a large green leaf; frequently lift the hat from the head and see that the cloth is wet. Do not check perspiration, but drink what water you need to keep it up, as perspiration prevents the body from being overheated. Have, whenever possible, an additional shade, as a thin umbrella, when walking, a canvas or board cover when working in the sun. When much fatigued do not go to work, especially after 11 o'clock in the morning on very hot days, if the work is in the sun. If a feeling of fatigue, dizziness, headache or exhaustion occurs, cease work immediately. Lie down in a shady and cool place; apply cool cloths to and pour cold water over head and neck. If any one is overcome by the heat send immediately for the nearest good physician. While waiting for the physician give the person cool drinks of water, or cold black tea or cold coffee, if able to swallow. If the skin is hot and dry, sponge with, or pour cold water over the body and limbs, and apply to the head pounded ice, wrapped in a towel or other cloth. If there is no ice at hand keep a cold cloth on the head and pour cold water on it as on the body. If the person is pale, very faint and pulse feeble, let him imbibe ammonia for a few seconds, or give him a teaspoonful of aromatic spirits of ammonia, in two tablespoonfuls of water with a little sugar.

FASHIONABLE DINNER.—There can be little doubt that the very late dinner hour patronized by modern society is highly unnatural, undesirable, and pernicious. The fatigues undergone by fashionable folks during the day do not tend to whet appetite—rather they serve to blunt its cravings—besides, the stomach of such is unfitted from properly fulfilling its functions. Of course tempting viands are presented on the dining-table, prepared by practised and skillful cooks, while the pleasures of love, friendship, and social converse become added as incentives. All the more dangerous, we should say. It is possible to cloy the stomach, and yet derive no benefit therefrom, but contrariwise. Better be in the condition of the Cambridge students of yore, and "diet upon fasting every day" than cause the human system to receive more than it can digest. "I restrained myself," observes Bacon, "to so regular a diet as to eat flesh but once a day, and a little at a time, without salt or vinegar."

NEAR-SIGHTEDNESS FROM STUDY.—The result of trials made at Breslau, Vienna, Lucerne, St. Petersburg and other points would seem to indicate that near-sightedness is not congenital, as has been usually supposed, but is caused by, and increases steadily under the pressure of study. Recent examinations in the United States would seem to point to the same result, or at least coincide closely with European investigations to this end. A careful examination of the eyes of the freshman classes at Harvard, Amherst, Brooklyn Polytechnic and New York colleges shows the percentage of near-sightedness to be the same for each, or 29.5. Other examinations by experts are said to show the eyes of young children to be natural, but between the ages of six and 18, the percentage rapidly increases. From this Dr. Home, of Buffalo, reaches the conclusion that the tendency is increased by study, and that one pupil out of every four who is a graduate at a high school is made near-sighted for life.





W. B. EWER.....SENIOR EDITOR.

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WRITE FOR THE MINING AND SCIENTIFIC PRESS. We invite not only professional men, but practical miners and mechanics to contribute to our columns. All communications will be kindly treated. Authors, as well as readers, will be benefited by corresponding.

Our latest forms go to press on Thursday evening.

#### SAN FRANCISCO:

Saturday Morning, July 14, 1877.

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#### The Week.

The week has brought news of no important developments in the mining regions or decisive fluctuations in the stock market. Since our last issue the largest single shipment of bullion ever made from the Comstock has been received.

It weighed nearly eight tons, and was valued at \$699,344. Of this amount, \$405,847 came from the California mine and \$293,911 from the Con. Virginia. In view of this evidence of prosperity, it certainly seems that the cry about hard times and the unproductiveness of mines is thoroughly unwarranted. Stock speculators are yearning for "a new bonanza," when sums like \$699,344 are sent down in a single shipment from an old one. However, that belongs to one set of people, and the new ones would probably enrich others.

The state of affairs on the Comstock is not very encouraging, to say the least, and the laboring class particularly feel the lack of employment. In another column we give an account of this matter and the generous way in which some of the difficulties are overcome.

Our "Mining Summary" gives all the latest news from the mines on different parts of the coast. The gravel mines are gradually closing down for the season and cleaning up. Quartz mines of course are being worked ahead with varying degrees of success.

We hope soon to hear of more activity on the Comstock, so that the many unemployed miners may once again have all the work they want.

The Krom concentrator at the Manhattan works will shortly be started up.

The water in the Carson river is very low.

#### Working Dry Placers.

For many years most experiments have been made with a view to economically work the numerous dry placers which abound in Arizona, New Mexico, and the States of Sonora and Chihuahua, Mexico, but until the recent introduction of George Ginn's machine, which substitutes air for water, the thousands of acres of arid gulch, mesa and gravel hill deposits have remained unworked, save during the rainy season, which occurs during the months of July and August.

The machine referred to is about six feet long, six feet high, and two feet wide, and has a vibrator frame consisting of three screens and three tables, suspended from the beams, which unite the four posts which form the corner braces. The screens or sieves, whose meshes vary in degrees of fineness, are placed directly and obliquely above each other in the upper half of the machine, while immediately beneath are placed the rawhide tables, each of which has a series of riffles, on which the gold and iron-sand lodge. The sand, gravel, and clay which carries the gold is fed on the upper and coarsest screen, and passes thence to the second and third screens in succession, and while falling from the last mentioned, the auriferous earth encounters a blast of air from a No. 2 Sturtevant blower, run at speed of 800 revolutions per minute. This blows out the sand and permits the iron-sand and gold to settle on the riffles, from whence it is taken and washed.

This machine, the result of two and a half years' thorough and numerous experiments, was founded upon the fact that a body is acted upon by air in proportion to the surface which it presents, and the additional fact that the gold, being from eight to twenty times as heavy as the gangue in which it is found, will fall against the riffles, while the lighter material will be blown away. In fine, it is resolved into a question of specific gravity.

This appliance has been thoroughly tried, and is now daily at work at the Jacarilla placers, in New Mexico, and has created quite an excitement there. A correspondent writes us from there and says he has seen \$8.50 in gold taken from it after a run of 16 minutes from dirt which washed 10 cents to the pan, and the machine will handle from 30 to 40 cubic feet of earth per day of 10 hours. Mr. Ginn, the patentee of the machine, was formerly a resident of Belmont, Nevada, and "the boys" will be glad to hear that he has at last achieved a triumph which bids fair to make the fortunes of others as well as himself, for it will enable the owners of placers destitute of water to work them with profit. Mr. Ginn is still at Jacarilla, and his partner, Mr. Hatch, will soon visit Prescott, Arizona, so that the miners there can witness the working of the machine. It is necessary, in using this appliance, that the earth must be perfectly dry before it can be worked, but in the countries where these rich dry placers occur the dampest earth can be dried in a few minutes in the sun, when it is properly spread out. It seems probable that this machine will revolutionize the present method of working the dry placers, and render available for mining large tracts of land known to be valuable, but heretofore unworked for want of proper appliances. It is claimed that the machine is perfectly satisfactory in its working in every respect, and that the miners are well pleased with it. As there are many of our readers who are interested in an appliance of this kind, it may be well to mention the names of a few prominent persons who have seen it work, and who may be applied to. Among them are Hon. H. M. Atkinson, Surveyor-General of New Mexico, Capt. Purington, 15th U. S. Infantry, Fort Stanton, and Mr. Markley, editor *Trinidad Chronicle and Enterprise*, Colorado. The machine will be of great value to New Mexico, where there are so many dry placers; and there are many other localities where it might be introduced to advantage.

**MECHANICS' FAIR.**—Those who intend making exhibits at the Mechanics' Institute fair, which opens on the 7th of August, have no time to lose in making their preparations. We urge upon our mechanics and manufacturers the advisability of making as good a show as possible, so as to bring our home manufactures before the public in a practical shape. These exhibitions are of great value to our industrial interests and should be encouraged in every possible way.

**ADMITTED TO THE SUPREME COURT.**—A class of four, after undergoing a satisfactory examination, have been admitted to practice in the Supreme Court of this State. The class consisted of Chas. F. Hanlon, Wm. Thomas, John L. Boone (of the MINING AND SCIENTIFIC PRESS Patent Agency), and J. A. Cooper.

The *Daily Stock Report*, which has recently moved its office down among the brokers on Leidesdorff street, has made its appearance in a brand new suit of type. The paper has been enlarged and presents a much improved typographical appearance.

The Baker rotary pressure blower is a very useful appliance for furnishing blasts to furnaces, etc., and may be used to great advantage in ventilating mines. The agents in this city are prepared to furnish these blowers of any size to suit requirements.

#### Dike on the Yuba.

Rescuing the Alluvial Bottoms from the Hydraulic Tailings.

An important work has lately been completed in Linda township, Yuba county, consisting of an extensive and costly levee or dike, designed to secure a large scope of valuable farming land from threatened inundation by hydraulic tailings. This dike commences at the Yuba station, on the California and Oregon railroad, being a little south of and nearly opposite the city of Marysville, and extends thence east along the south bank of the Yuba river to the foothills, a distance of eight miles. The country protected by it lies south of the Yuba, between it and Bear river, and comprises some 30,000 acres of rich alluvial bottoms.

In no part of the State has the damage to the agricultural lands, resulting from this cause, been so great as along the Yuba, the bottoms here being low-lying and extensive, while the quantity of debris brought down by this stream has been very great. Poured out from the hydraulic mines in enormous quantity, these tailings had so accumulated in the channel of the main Yuba as to raise it many feet above its original level. Being so filled up, the muddy water during floods, or even moderately high stages, escaping from the river bed, overflowed the adjacent flats and deposited thereon the comminuted sand and particles of clay held in solution; a process that being repeated year after year had covered up to a depth varying from a few inches to several feet, some 15,000 or 16,000 acres of good land, the most of it lying on the north side of the river.

#### Only a Temporary Harm.

This debris brought down from the mines being rich in plant-feeding properties, would have benefited instead of injuring this land, could it have been applied in suitable quantities, and in the proper manner. Pouring in, however, as it did, at unreasonable times and in excessive quantities, it not only interfered with farming operations here, but rendered them, at last, wholly impracticable. These sedimentary deposits do not, however, prove irretrievably hurtful to the soil. When they shall have so accumulated as to raise the surface of this land above their further reach, it will again be susceptible of cultivation; these bottoms having in the first place been made up of this same sort of material, brought down and left by former floods. As some, and perhaps many, years will be required to so reclaim these lands, and thus restore them to usefulness, the owners, through their non-enjoyment, must meantime suffer loss; and it is of this they complain, alleging that for every injury the law ought to afford a sure and sufficient remedy. Hence the numerous suits brought by the farmers owning land along Bear river and elsewhere in the State, seeking to recover damages for this sort of injury.

#### The Farmers Move in the Matter.

Having hurried up most of the flats lying north of the river, these tailings were about to invade this tract of alluvial country on the opposite side, the site of many fine farms, the most of which had, up till last summer, escaped inundation. With another flood, however, such as frequently happens on these mountain streams, and as there was reason to expect would occur the past winter, this large area of valuable land would, in all probability, have been covered up and temporarily ruined.

The owners, alarmed at this prospect, proceeded during the summer to organize the same into a levee district, after which they procured a survey for the line of a dike, with estimates of its probable cost to be made. This done, the cost of the contemplated work would, it was found, greatly exceed their means, necessitating the abandonment of the project or the procuring of assistance from some other quarter.

#### The Miners Come to Their Relief.

In this emergency, recourse was had to Messrs. Pierce, O'Brien and McCanney, owners in the Smartsville and other hydraulic properties, and who, from their liberal views, well-known energy and large experience, it was thought, might with their counsel, if not with more substantial aid, be of service to these parties, application having meantime been made to the county authorities for such assistance as they might see fit to render. The above gentlemen, though not more interested in the scheme than many other mine and ditch owners, perceiving the strait the farmers were in and the importance of the proposed improvement, concluded to take hold and put the work though on their own responsibility, trusting to such assistance as might be obtained from the county, the farmers themselves and their fellow miners to help them out; it being now too late in the season for them to stop and ascertain exactly how much these several parties would contribute towards defraying the entire cost, which it was estimated would amount to about \$30,000.

#### James O'Brien,

One of the three gentlemen mentioned, having arranged with his associates, Messrs. Pierce and McCanney, to execute the job, commenced active operations in the month of September, and putting on a large force of men and teams, would have finished the embankment before the advent of winter had not the heavy and wholly unex-

pected rains of October interfered with the progress of the work, the cost of which was at the same time largely increased. Mr. O'Brien, who even among the hydraulic miners is noted for push and pluck, kept his force in the field, losing scarcely a day during all this inclement weather, thereby finishing the structure in the early part of the year.

#### The Dimensions of this Levee

Are as follows: Length, eight miles; breadth on top, 12 feet for about three-fourths of the length and 20 feet for the balance, with a slope of two to one on the inner and three to one on the water side; height, five feet above extreme flood-line. Through the embankment six large iron pipes with gates have been laid, to admit the escape of any water that may accumulate on the inner side. The outer face of the dike for a distance of two miles has been covered with a lining of willows, to prevent its being washed away at high stages of water, another mile having for the same reason been protected by substantial brush fence. This dike contains about 200,000 cubic yards of embankment, the greater portion of it composed of the red soil common to the country, and which, when thrown up, as the most of this has been, in a wet state, hardens almost to the consistency of a brick, enabling it to well withstand the action of water. Such sections of the dike as are composed largely of mining debris, a sandy material, have been protected by the facing and fence of willows mentioned. Many of these willows will, it is expected, take root and thus very effectually guard the embankment against wash or other cause of abrasion.

#### The Good Already Done.

Notwithstanding the past winter proved a dry one, this levee has already effected much good. The farmers feeling that their land was through its protection secured against the further inroads of the mud-laden waters, went on and planted a considerable portion of it to grain, fine crops having been gathered this summer from fields before neglected, either through fear of overflow or because they were too wet for tillage. Hereafter the whole of the land defended by this dike will no doubt be kept under the plow and made to yield good crops, as the soil is everywhere rich and susceptible of culture.

As this levee stands back some distance from the bank of the river, a large area has been provided for the reception of the hydraulic tailings, it being calculated that it will require many years to fill it up. When these tailings, accumulating, shall have nearly reached the top of the embankment, it will be an easy matter to raise it somewhat higher, increasing in like ratio the capacity of this receptacle.

#### A Plan Worth Considering.

A number of experienced civil engineers, practical miners, and other competent judges have examined this levee, and, besides speaking approvingly of the manner in which it has been constructed, express the opinion that it will fully meet the requirements expected of it. This being the case, we do not see why recourse might not be had to similar structures for the protection of farm lands elsewhere exposed to the invasion of this troublesome material. The injury caused to the bottoms along Bear, Feather and some other rivers in the State is already quite serious, and unless checked must go on increasing every year. To suffer this cause to continue in active operation must eventually lead to very grave consequences. How it shall be stopped is a problem, the solution of which has for some time exercised the ingenuity of our best mining engineers, the most of whom we believe consider this method of diking the river banks the most feasible.

#### A Bad Way.

The farmers, in some instances, have sought relief against these grievances in the courts, there being now a large number of suits of this kind pending against the hydraulic miners throughout the scope of country drained by Bear river. How these suits will terminate cannot, of course, be predicted; though, judging from the rulings of the court in some of the cases now on and the results in others already tried, the outlook is rather ominous for the farmers.

Litigation is at best, however, a poor way of settling these disputes, and we cannot help thinking the plan that has been adopted in the instance under consideration is by far the best, and, as such, we commend it to the attention of parties interested in this subject. The course taken by the miners in this case has, it is believed, had the effect to estop many lawsuits that would otherwise have been commenced against them, and the cost and bother of which would have greatly exceeded the money donated by them for this beneficial improvement. It is to these men a saving of money and a monument of honor.

The miners on the Yuba have acted nobly in this matter, having already paid in or made themselves answerable for more than \$30,000 towards the cost of this improvement, Yuba county having contributed \$10,000, and the owners of the land benefited \$7,000 towards making up the amount expended upon it, the total having reached nearly \$50,000. There are still a number of hydraulic miners interested in this enterprise, who have not as yet contributed anything towards defraying its cost. To their credit be it said, however, they are all willing to stand in and bear a fair share of the expense when called upon to do so; at least this is what we gather from the reports that reach us from the mines and from conversations had with some of these parties.



## Best &amp; Belcher and Chollar.

The annual meetings of the Best & Belcher and Chollar-Potosi mining companies were held this week. The total receipts of the Chollar for the past year amounted to \$1,047,653.52, of which the chief items are: \$710,941 from bullion, \$196,202 from assessments, \$100,000 borrowed from Mr. Livingstone and \$33,661 overdraft at the Bank of California. The chief disbursements were: \$420,153 for the redemption of ore, \$190,494.69 for mine labor, \$185,469 for Chollar-Norcross-Savage shaft, \$71,500 for interest and discount and \$75,881 paid overdraft from last year.

The Secretary's report of the Best & Belcher showed a deficiency of \$58,182, which will no doubt necessitate another assessment.

The Superintendent, F. F. Osbiston, gives a lengthy account of the work of the past year, from which we condense as follows: On the south station (1167-foot level), the lateral drift running north from the Gould & Curry shaft through our mine, and connecting with the upper stopes of the Con. Virginia, has been reopened and retimbered the entire length of the mine and will, in the course of a week or two, be completed to the Con. Virginia shaft. When this is done there will be a good circulation of air and we will be in position to cross-cut. By referring to the map accompanying this report you will see that very little cross-cutting has been done on this level, and, judging from the character of the ground passed through in the lateral drift, the chances of finding ore appear to me to be good. We could not get at this work before on account of the whole drift being caved and in a wretched condition, but now that the Con. Virginia has expended so much time and money on this, to us, valuable piece of work, we will be able to use it for prospecting this level thoroughly.

I am satisfied the water tapped, both in Gould & Curry cross-cut and our No. 3, comes from the same vein that was cut in the 1500-foot level east drift, and which contained ore, and I therefore consider our chances for finding ore in the 1700-foot level most encouraging.

It was necessary during the first part of the past year to run a large exhaust fan on the surface for the purpose of drawing out the hot air from our drifts, but for the last three months the Gould & Curry shaft having become a down-cast shaft, it has been unnecessary to run the exhaust fan, which is a great saving to the company. The mine is now in fine condition to do an immense amount of prospecting cheaply.

The air in the north and south drifts on each level is perfectly cool. During the coming year I would suggest that in addition to opening the 1700 and 1900-foot levels, a thorough prospecting of the 1200 and 1500-foot levels, as it is now practicable to do so. I repeat, that in my opinion, our prospects are most encouraging, and that early in the coming year important and valuable developments will be made.

## Delinquent Taxes on Mines.

The District Attorney of Storey county, Nev., has discovered that a number of the mining companies, owning mines within the county, are delinquent in the aggregate of nearly \$1,000,000 for taxes. The exact sum of the principal is \$942,401.02, whereof \$851,867.27 is due in gold, and \$90,533.75 in greenbacks. Add the accrued interest to the principal and the sum will exceed \$1,000,000 in gold. Payment was refused on the assumption that, as the mines belong to the United States, their production in bullion is not taxable by act of the State Legislature. A late decision of the United States Supreme Court has overthrown this assumption, and the District Attorney is confident that the whole amount can be collected. The whole number of suits to be brought will be about 100. These back taxes delinquent are from 1869 to 1875. The *Enterprise* gives the following list of mines and amounts, payable in gold: American mining company, \$125.49; Andes, \$32.85; Bacon, \$460.39; Belcher, \$295,214.53; Brophy, \$41.19; Bowers, \$17.25; Chollar, \$63,425.60; Crown Point, \$219,561.64; Caledonia, \$1,173.20; Challenge, \$31.21; Consolidated Virginia, \$172.746.11; Empire, \$2,457.99; Gould & Curry, \$6,650.08; Gold Hill Quartz, \$10.67; Hale & Norcross, \$26,939.76; Hartford, \$36.95; Imperial, \$312.01; Justice, \$196.29; Kentuck, \$6,662.20; Luzerne, \$113.49; Lady Bryan, \$42.13; Mides, \$22.43; Ophir, \$10,877.63; Overman, \$547.53; Occidental, \$23.12; Savage, \$19,226.45; Segregated Belcher, \$277.55; Suecor, \$956.27; Sierra Nevada, \$1,369.55; Silver Hill, \$472.35; Vivian, \$46.79; Woodville, \$466.48; Yellow Jacket, \$21,377.04. Total, \$851,867.27. Amounts payable in currency: Savage, \$37,016.22; Chollar-Potosi, \$8,489.81; Crown Point, \$10,706.16; Kentuck, \$14,617.82; Yellow Jacket, \$3,494.82; Burke & Hamilton, \$103.53; Bacon mill and mining company, \$1,072.56; Confidence, \$147.29; Empire mill and mining company, \$467.97; Eclipse, \$256.11; Gold Hill Quartz, \$251.48; Gould & Curry, \$1,067.88; Hale & Norcross, \$4,517.59; Imperial, \$2,064.09; Overman, \$629.91; Ophir, \$46.34; Winters & Kustel, \$219.38; J. B. Winter, \$175.48; and others, making a total of \$90,533.74.

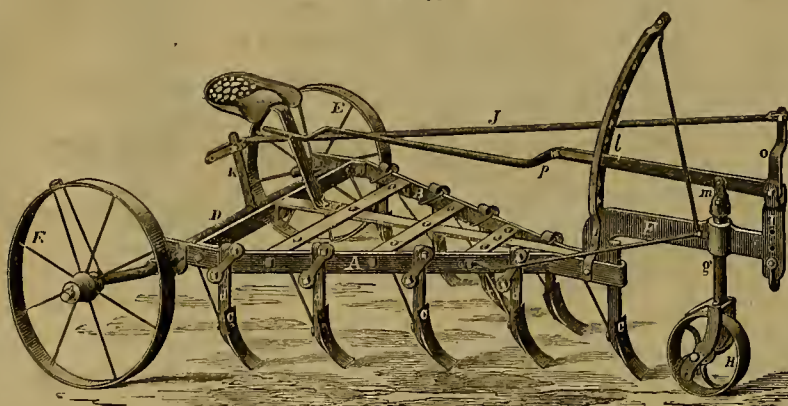
The diamond drill is again running in cross-cut No. 3 of the Best & Belcher mine.

## An Improved Cultivator.

We illustrate on this page a California invention, which seems worthy of the attention of users of agricultural implements. It is an improved cultivator, for which letters patent have been obtained by John Jones, of Stony Point, Sonoma county, through Dewey & Co.'s Agency. Mr. Jones has disposed of the controlling share in his invention to Messrs. Sidney B. Holly and William H. Magoon, of Stony Point, and these gentlemen are engaged in bringing the cultivator to the attention of the farmer. The cultivators may be seen at Marcus C. Hawley & Co.'s store on Market street. Our engraving gives a good view of the implement. As may be seen, Mr. Jones's invention is an improvement which consists in a novel combination of levers for enabling the driver to raise and lower the frame and plows or teeth without leaving his seat, all as hereinafter described.

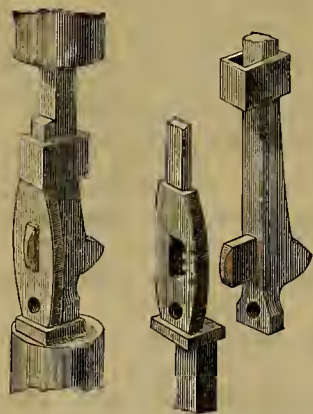
In the engraving, A and B represent the two diverging timbers or beams of a V-shaped plow or cultivator. The plows or cultivator teeth, C C C, are secured to the standards d d d, while the upper ends of the standards are secured to the beams in the ordinary way. The rear ends of the beams are supported upon an axle, D, which is cranked at both ends, and upon the journal formed by each crank is a hearing-wheel, E.

A strong beam, F, has its rear end firmly secured between the two forward ends of the



HOLLY &amp; MAGOON'S IMPROVED CULTIVATOR.

timbers A B, so that it will project forward a short distance in advance of the frame and front plow, similar to the beam of a single plow. A hole is made through this beam, through which the vertical spindle g of the front or swivel wheel H passes. The forward end of this beam or short pole is turned upward, so as to form a standard, I, and is provided with holes for the attachment of the clevis or whiffletrees, as represented. To provide for raising and lowering the frame and plows, the angle of a bent lever is attached to the upper end of the standard I. The short arm, O, of this lever extends upward, and its extremity is connected with the extremity of an arm, K, which pro-



COUPLER FOR ARTESIAN WELL RODS.

jects from the rear axle, D, at a right angle to the cranks upon which the wheels are carried by means of a connecting rod, J, which passes back over the frame and under the driver's seat. The long arm p of the bent lever extends directly back through a rack, L, near the driver's seat, so that it can be easily grasped by the driver. The upper end of the vertical spindle g of the steering wheel is connected with the long arm p of the lever near the fulcrum by means of a link, m, so that the movement of said lever operates to rotate the rear axle about its cranks and raises or lowers the beam F on the spindle g.

When the frame is to be lowered, the driver frees the lever arm p from the rack and raises it, thus dropping the beam F on the spindle, and, through the arms O K and rod J, turns the crank axle so as to lower the rear end correspondingly. A reverse or downward motion of the lever transfers the fulcrum of the lever arm p from the standard I to the upper end of the spindle g, and rotates the crank axle in an opposite direction, thus lifting both the frame

and plows out of and above the ground.

This arrangement of levers is very simple and convenient, and the power of the driver is applied at the best possible advantage.

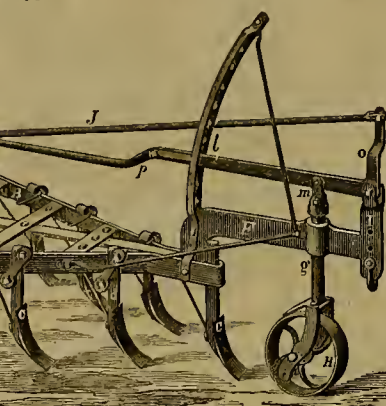
Thus the teeth may be drawn up and a corner turned with perfect ease, while in the old machines the frame was racked with the side draft, and the cultivator apt to turn over at the corners.

These implements have had a year's trial both in sandy and adobe soils and the inventors are full of assurance of their value. The soil is perfectly worked by them. There are three sizes made for three, four and six horses.

## Rod Coupling for Boring Wells.

We illustrate on this page an improved coupling for connecting such rods as are used in boring artesian wells. It can also be used for connecting other tubes and rods where great strength is required and rapidity in connecting and disconnecting the pipes or tubes is desirable.

This improved coupling consists of two interlocking parts. Each rod or tube to be connected together is provided with an extension like that shown, the upper ends being fitted with one kind and the lower with the other, as shown, in the usual manner of providing rods or tubes with male and female couplings. These two parts are slipped together and a hand of iron slipped down over the end until it rests on the



shoulder, as shown, thus firmly securing the two extensions together and coupling the two rods. The device is so simple that no extended description is necessary, the engraving showing the operation clearly.

There is no weld except in the hand which secures the parts in position when coupled. This hand is so made as to slide easily from its secured position upward, thereby allowing the lower half to be removed from the upper part. One part is constructed with a slight bend, as represented, so as to bring the bearing on a direct line with the other bar. It will be seen that the elbow or hook is nicely fitted to the hole in the other bar; it is also designed that the shoulder and hook or elbow shall equally share the weight of whatever may be above them when coupled together, thereby greatly diminishing the wear when pumping or drilling. When necessary, the band is secured in position by drawing a key through a small hole made for the purpose. Any one who has ever had anything to do with coupling the rods together in boring, will see the value of this little device, which was patented through the MINING AND SCIENTIFIC PRESS Patent Agency, by Theodore D. Culter, of Westminster, Los Angeles county, who may be addressed for further particulars.

**BULLION SHIPMENTS.**—Since our last issue shipments of bullion from prominent mines have been as follows: Con. Virginia, July 3d, \$263,911.18—total to date, \$867,827; Northern Belle, 3d, \$9,820; Empire (G. V.), 3d, \$14,500. Tyho Con., 5th, \$4,409.28—total to date, \$8,806.93; Northern Belle, 5th, \$7,706.13; Standard, 5th, \$23,221.67—total for June, \$49,534.43; California, 7th, \$66,386.55, first shipment for July; Con. Virginia, 7th, \$212,999.78—total to date, \$1,080,827.12; Washington, (Cal.) 4th, 242 ounces gold bullion; Grand Prize, 7th, \$7,300; Tyho Con., 7th, \$3,683—total to date, \$17,490; Leopard, 8th, \$3,600; Modoc, 2d, \$3,735; on the 6th, \$4,188; on the 8th, \$4,324—total to date, \$12,298.

The Board of Supervisors have finally passed a resolution granting J. S. Kohn and others a franchise to run an elevated railroad from Valencia and 26th street, along 26th street to Bryant, and thence out the Western Addition to the ocean. There will be now a practical opportunity to test the merits of the prismoidal railroad under the immediate observation of our citizens.

INFORMATION is received of the death of Prof. S. Tenny, of Williams College, while he was visiting a sister in Michigan. This will probably break up the Williams Scientific Expedition, of which he had charge.

CHOLLAR-POTOSI produced \$24,626 in June; California, \$1,567,931; Idaho (Grass Valley), \$38,246; New Coso, \$70,064, and Tyho Con., \$107,573.

## Eastern Mines.

Every now and then we hear of wonderful mineral discoveries in some one of the States to the east of the Rocky mountains, which, judging by the way they are usually referred to in the dispatches, seem likely to eclipse anything previously found. The latest instance of this kind has occurred at Milan, New Hampshire, where, according to the dispatches, "an enormous lode of copper, lead, gold and silver, 20 feet in width, has recently been discovered. The lode crosses the Grand Trunk railroad, 100 miles west of Portland."

One peculiarity worthy of note in these remarkable discoveries is, that the miners do not seem satisfied with the discovery of one kind of ore at once, but usually manage to unearth half a dozen kinds in one lode. Another feature is, that the lode is always large; and still another, that after a little while nothing is heard of the magnificent find. There are some excitable persons in the world, and a good many of them, too, who think if they ever strike a lode that they are going to make their fortune in a day. As a general thing these people may be set down as having very little experience in mining, although some old miners are just as bad. But this tendency to exaggerate the importance of new discoveries which have not even been prospected is not confined to any particular locality. Scarcely a month passes that we do not hear of a find on this coast somewhere that is going to equal or excel the Comstock. Whenever a prospector finds a big pile of croppings he thinks he has got a second Comstock. This happens more frequently in some of the newer districts of course, for intelligent miners know that a Comstock is not struck very often and moreover it takes a good many years to prove up a thing of that kind.

Our Eastern friends, however, seem to think that if they find any mineral indications at all they have something richer than anything ever found before, and immediately herald it abroad and proceed to get up a company to work "the mine." If they knew enough about the matter to only find one or two metals in the ledges it would take better; but when they have gold, silver, copper, lead, tin, etc., all at once, anybody who knows anything is apt to fight shy of the undertaking. As long as they stick to coal and iron hack there they will do very well, but the precious metals are peculiarly the province of the Pacific coast, and what few gold mines there are in one or two of the Southern States make small showings when compared with what we have out here.

## Items of Interest from the Mines.

We give below items of interest from prominent mines, most of which are collated from letters of the respective Superintendents on file at the offices in this city:

The average assays from drift No. 3 of the Eudowment are \$188 per ton.

The De Fries company expect to have their steam hoisting works up in a few days, when they will quickly have a quantity of good milling ore on the surface.

The water is now all out of the North Con. Virginia mine.

The mill started up on Alps ore on the 7th. The air engine has been placed in the Utah mine.

South lateral drift from the 1900-foot level of the Ophir has been started with Burleigh drill. The Grand Prize mill is nearly completed.

Last week's operations at the Chollar showed 606 tons of ore extracted, assaying \$22.50 per ton.

In the Justice the winze and upraise on the 1000-foot level continue to look bright at the latter point; the ore body shows great strength; the stopes on either side of the upraise are developing a continuance of the same well defined vein and equally as productive.

The ore in the face of the Electric tunnel improves as they go in.

The Coso Consolidated stopes continue to yield good ore.

The section of incline in the Hale & Norcross above the 1900-foot level, including the 1900-foot station, which required retimbering, has been completed.

In the Eureka Consolidated the ore bodies continue to look encouraging and hold out well. The 5th level ore body is looking first rate and increasing in yield as developments extend. The connection between 5th and 6th levels is completed and in ore all the way.

The Con. Virginia letter says: "On the 1300-foot level from our shaft the south drift has been extended 25 feet; total length 479 feet; 30 feet yet to run to reach the south winze, which connects with the level above. This will give us a fine volume of air and enable us to reach all the southern ore breasts from the 1300-foot level up. On the 1400-foot level the ore breasts continue to look excellent. On the 1650-foot level the ore breasts continue to look very favorable. The south drift in the east ore body is connected with the east drift from the deep winze and it has much improved our ventilation. The ore is good in these drifts throughout. The south drift will be continued south in the ore body. The west ore body is widening as we work south."



## Krupp's Works at Essen.

Apart from the steel works of the Messrs. Krupp, the town of Essen, in Prussia, has very little interest for the traveler. As all the importance of Stratford-on-Avon is derived from the accidental circumstance that Shakespeare was born there, so all the interest that centers around Essen arises from the fact that it is the location of this remarkable steel-producing establishment. It is not always that the visitor can obtain an order of inspection, but very fortunately Dr. Edward Young, chief of the United States Bureau of Statistics, was able to do so some few years ago, and has given a record of what he saw in his admirable work entitled "Lahor and Capital in Europe," published by Messrs. Truhner & Co., of Ludgate Hill. The population of Essen consists of some 52,000 inhabitants, nearly all of whom, directly or indirectly, derive their means of livelihood from these works. The number of men actually employed in the works at Essen is 12,000, and in coal mining, etc., 5,000. The cast-steel produced last year was 125,000 tons. The whole value of steel, steel guns, shafts, tires, rails, wheels, axles, etc., produced in 1871, was 12,000,000 thalers; the iron and iron-ore used was 200,000,000 pounds; the coal used per day was 30,000 centner, or nearly 500,000 tons per annum. The coal now costs 24 thalers per 100 centner, five tons, or nearly 2,400,000 thalers. The number of crucibles used per day is 5,000; the total cost of coal per annum is 250,000 thalers; and the total cost of labor is 5,000,000 thalers. The wages of the men average 13 thalers per day, but the wages are regulated according to the skill of the work-people—those in the forging and finishing shops receiving the highest pay. The unskilled workmen only receive four thalers per week, though how they contrive to keep body and soul from dividing upon this payment is a problem which it would puzzle an economist to solve. The number of hours worked per day is 11, and the works are continually going. To increase their earnings many of the men work extra hours, and even on Sundays. We should be very sorry indeed to see English workmen paid so badly as to render the temptation to work on Sundays so great. At the end of the year Mr. Krupp distributes a large amount in benefactions, and these, like the weekly wages, are regulated according to the results. Workmen when sick get half wages, and are cared for in hospitals without cost. The firm contributes one-half as much as the aggregate contributions of the men. Mr. Krupp is building houses for his work-people, and in a variety of ways evidences his interest in their welfare. Speaking of the quality of the steel, Dr. Young says: "With regard to the soundness and good quality of the steel castings made in this establishment, they appear to be entirely faultless. I saw immense guns, nearly completed, intended for exhibition at Vienna next year; an immense shaft for a steamship of one of the German lines to New York, which seemed the very perfection of workmanship, and for which one thaler per lb. was to be paid; and great numbers of other manufactures of steel, either completed or in progress, all of which appeared to possess great excellence. In regard to tools, machinery, and appointments, these works do not, in my opinion, surpass in excellence those of the steel works of Messrs. Firth & Sons, of Sheffield. But as the products have obtained a higher reputation than those of any other manufacturer, how is this admitted excellence obtained? No doubt it is in part due to the analyses of the various ores from his mines in Germany and Spain, and from Great Britain and other countries, and from experiments made by the experienced and analytical chemists in his employ. But, in my opinion—the opinion of an inexperienced metallurgist and mechanical engineering—this firm has no secrets in regard to the admixture of various kinds of iron which, if known, would enable manufacturers to produce as good steel. The superiority is, I believe, owing to the following causes: Most of his workmen have been for a long time in his employ, and have great experience and skill; his foremen thoroughly understand their business, possess technical training, and practical knowledge. These are all attached to the proprietor by his practice of giving extra pay for skilled work, by his annual gratuities, by his generosity exhibited toward the men in every possible way, and his sympathy with them. His workmen are thus warmly attached to him, and strive to promote his interest by performing their several duties thoroughly and well. In the reputation of the establishment for excellence of workmanship, they are, therefore, interested." The works were established by Mr. F. Krupp in 1810, who died when the present Alfred Krupp was little more than 14 years of age. Leaving school, he seems to have continued the works on a very small scale at first, but gradually the quality of the work turned out brought the name of Krupp into repute, so that to-day anything that leaves his works is regarded as little short of perfection. The works have been so developed that at this time they cover a continuous area of more than 4,784,000 square yards, of which about 900,000 square yards are covered in. It must be evident from the circumstances under which the present Mr. Krupp took possession of the works that he is a man of no ordinary talent and business energy. Even since Dr. Young visited the works they have been developed still further, and it is impossible to predict what their ultimate dimensions will be.—*Mining World.*

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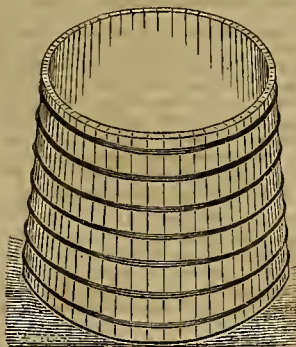
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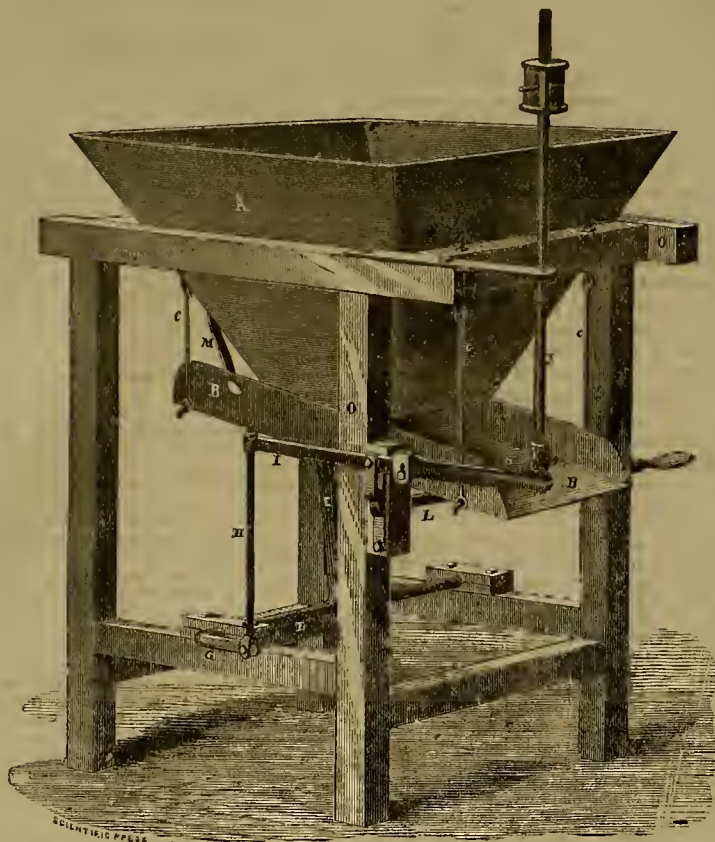
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We append a few extracts from the many testimonials which we have received from mill men and practical  
 mining men, of the effectiveness and positive action of the Tulloch Feeder. We do not depend solely upon these  
 testimonials, as we are aware that testimonials are easily secured for almost any machine, but the high character of  
 the parties certifying to those herewith given, will establish their value and genuineness.

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 sider no mill perfect without them. Mr. E. R. Burke, Sumner mine, Kern county, has 16: They never get tired; no  
 man living can feed a battery as well; they save us in labor alone \$48 a day. Mr. Green, of the Phoenix mill (12),  
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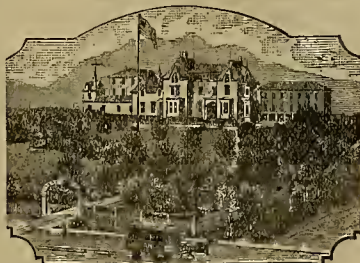
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Testimonials, Circulars and Price Lists, illustrative of the most recent improvements in this  
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Rev. DAVID McCURE, Principal,  
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The undersigned, owners of LESCHOT'S PATENT  
 for DIAMOND POINTED DRILLS, now brought to the  
 highest state of perfection, are prepared to fill orders  
 for the IMPROVED PROSPECTING AND TUNNELING  
 DRILLS, with or without power, at short notice, and  
 at reduced prices. Abundant testimony furnished of  
 the great economy and successful working of numerous  
 machines in operation in the quartz and gravel mines  
 on this coast. Circulars forwarded, and full infor-  
 mation given upon application.

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## KNIGHT'S WATER WHEEL.

A model of this justly celebrated wheel can be seen at  
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ALMARIN B. PAUL,

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## San Francisco Cordage Company.

Established 1858.

We have just added a large amount of new machinery of  
 the latest and most improved kind, and are again prepared  
 to fill orders for Rope of any special lengths and sizes. Con-  
 stantly on hand a large stock of Manila Rope, all sizes;  
 Tanned Manila Rope; Hay Rope; Whale Line, etc., etc.

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Belting, Packing, Hose, and Other  
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Send for Illustrated Catalogue.

CAUTION  
TO HYDRAULIC MINERS.

All persons, excepting those having the right by pur-  
 chase from me, are hereby cautioned against using, or  
 making, or selling any device for turning the discharge  
 pipes of hydraulic machines which uses the deflecting  
 force of the stream of water.

Any such device is an infringement of United States  
 Letters Patent, granted to me on the 16th of May, 1876,  
 and re-issued September 19th, 1876.

I have commenced suit against Richard Hoskin for in-  
 fringing my said patent, and intend to prosecute all par-  
 ties using such Defectors without license from me, there  
 being no other way to protect my rights.

Any parties wishing to purchase the right to use this  
 device can do so by making application to me.

HENRY C. PERKINS,

North Bloomfield, Nevada County, Cal.

## BLACK DIAMOND FILE WORKS.



G. &amp; H. BARNETT,

Manufacturers of Files of every Description,

Nos 39, 41 and 43 Richmond street,

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Sold by all the principal hardware stores on the Pacific  
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Used in Connection With PURVINE

Wooden Amalgamating Pans and Settler.

This is a complete, perfect and economical adaptation  
 of the humul method to the treatment of Gold or Silver  
 ores, associated with

## COPPER

And other base metals, or to ores free from base metals.  
 It can be adapted to any first-class Gold or Silver mill, at  
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 low rates.

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MENZO SPRING,

9 Geary Street, San Francisco.

GUIDO KUSTEL,  
 MINING ENGINEER and METALLURGIST.

P. O. Address: ALANEDA, CAL.

SCIENTIFIC PRESS.—As the old year is drawing to a close  
 and the new is rapidly approaching, all our mining  
 friends should subscribe for this scientific journal, espe-  
 cially devoted to their interests. It is a California enter-  
 prise, and compares favorably with similar organs of  
 years more experience and age in the old countries.—  
 Colfax Enterprise.

\$55 & \$77 a Week to Agents. \$10 Outfit Free,  
 P. O. VICKERY, Augusta, Maine.



## Continued from Page 21.

being reduced at the Leonard mill. The workmen will be paid up, for the past month, next week.

FRANK HUNT and Sam Slate are jubilant at their prospects in the Rambler, a new mine, located only a few yards from the Court house, in this county. The rock is liberally streaked with gold, and several hundred dollars' worth of it has been extracted recently. There can be no doubt of the fact that the entire hill in the vicinity of the Rambler is one vast bed of mineral wealth, which will not be exhausted for generations to come.

## Montana.

AVALAANCHE GULCH.—Helena Independent, June 28: Twelve miles of this gulch are under patents. Hank Bros. have opened the gulch at points eight and nine miles from the mouth. At the upper point they have breasted out 200 feet 27 feet wide, which paid from \$10 to \$20 to the hand. Below them, Gregory, Hart & Co. have a drain down below Grant. John Gou, of Cave, is an equal owner in this body of ground. Shannon, Cox & Mayne, just below them, have a drain down to gravel. Wunderlin & Center have another drain down to pay, next below Hank's. Above, Dunsold & Baise have a drain on bedrock for 400 feet, but have not got across the succession of reefs. They are just getting into the bedrock. Hank & Co. also have a drain down 20 feet. The average depth of the ground is about 25 feet. Wesley Baise, D. A. Carlisle, Warren Tucker and Curt L. Harrington own ground here and there along the gulch, they having let some of the ground now being opened out and worked on shares for opening. On the upper bar, Blackwell, Baise, Carlisle and Harrington's hydraulics are running. This bar is two miles long and will last for 20 years, but the diggings pay uniformly well.

At Springtown, Marshall & Hornbuckle, Hertop, Wright & Co. and J. V. Stafford are running flumes on American hill. M. H. Marshall & Sutton are running a hydraulic at Jintown and employing a number of men. De Bourd & Co. are working in Price's gulch. Mahaney, Oxley, Quale, Holland & Terrell, Cotter, Bryson & Hightower and Williams are working in Oregon, New York and tributaries.

At Grennell's bar, on the Missouri, Einhorn & Davis, Kelley & Co. and E. J. Robinson are at work, the latter running a hydraulic and has not yet made a clean-up. Einhorn and Kelley have good diggings. Ingersoll, Handley, Mayo, Lawrenson and Conrad & Co. are running a drain in Cave, just above Springtown, and are 43 feet down. This gulch is now opened and prospected, but was filled by the flood last year. Olsen & Hausen are doing well in Upper Cave.

WHOP CR.—These mines are on a bar two miles above Toombs's ranch. Two hydraulics are running, one by Stagner, Rotwitt & Ferguson, the other by Warner & Co. These mines are easily worked, and, judging from the coal in sight, they must be good.

Ocean A. Robinson and D. F. Hedges have leased the Pittsburgh ditch, at French bar. They use some of the water, employing four men, let some on shares and sell about 100 inches. C. Drinkwater & Son are working ground on shares and doing well. Gray & Lightbody, Henderson & Co., Zuerger & Co. and Webber & Radford are at work. Mr. Pie, a very intelligent Chinaman, is running an extensive claim, and one other Chinese company are working. John Bird, of New York gulch, is on the bar.

## Oregon.

BURNT RIVER.—Cor. Bedrock Democrat, July 4: There is quite an excitement about placer mines about four miles east of A. J. Weatherly's ranch, near the summit of the mountain between Burnt and Snake rivers, on the Burnt river side of the mountain. Huffman and Nickem looked out this week \$50. The diggings are extensive. Antioch Frier and H. B. Frans have sunk a shaft on their quartz ledge 50 feet deep and started to run a level, and have struck a rich chimney in the Tilden mine, and are taking out large quantities of \$100 to the ton from a four-foot vein of free gold. The extensions on the same ledge are the Hendricks and Bulldozer. This ledge shows for 6,000 feet and is from four to six feet wide; it shows free gold, and prospecting is going on on Gold mountain. The Banche mine is showing a three-foot vein and that has since disintegrated on exposure to the action of the atmosphere and frost, so as to be readily worked. Another advantage gained by the opening of this race, is that the water used in Pomer and California gulches, that formerly escaped into Powder river, is now diverted into Blue canyon, where it is utilized in ground sluicing for the bedrock flume.

POKER FLAT.—Graham & Co. are opening some claims on this flat, about one mile from Auburn. We visited the scene of operations and found a race, one-half mile in length, 20 feet wide top, 8 feet on bottom and from 20 to 25 feet in depth, cut through the solid bedrock in the ridge which separates Blue canyon from Pomer flat. This race reaches the flat at a sufficient depth to thoroughly drain it. Prospecting was done here years ago, and gold found in paying quantities over quite an extensive area. These diggings have been enriched by the deposits of debris from Parker gulch, which being of a sticky nature, brought quantities of gold and amalgam with it, that has since disintegrated on exposure to the action of the atmosphere and frost, so as to be readily worked. Another advantage gained by the opening of this race, is that the water used in Pomer and California gulches, that formerly escaped into Powder river, is now diverted into Blue canyon, where it is utilized in ground sluicing for the bedrock flume.

FORT SUMMIT.—The present mining population consists of six white men and about 130 Chinese. The Chinese claims are situated principally on the bars and rims along Powder river for about three miles below town, while a few companies are working claims in the river above and on the east side of the south branch of Powder river. It is supposed that these claims are paying well, but as the owners give no definite information, no amounts can be given. The Downie Bros. claims are situated in the hill on the west side of this branch. They are now thoroughly prospected, and the most sanguine expectations of the owners fully realized. The banks are all gravel, from 20 to 30 feet in depth and prospected evenly and well throughout. The natural facilities for working, such as pressure, fall and dump, are all that could be desired, and the available amount of water cannot be worked out in 50 years. Messrs. Rimbo & Young have lately purchased the ditch and bar digging opposite town for the sum of \$300. They have found excellent prospects in what was heretofore considered the bedrock, but which proves to be slightly cemented gravel. They are preparing to commence operations on this ground. The mines of Fort Sumner are well supplied with water during the entire season. Mr. Rimbo owns nearly all the water rights on the main Powder river, and sells water for one cent an inch.

## Utah.

ALTA.—Cor. Salt Lake Tribune, July 6: I think the Flagstaff the best timbered mine in the camp. It is now shipping 1,200 sacks per day.

My next visit was to the Prince of Wales. Work on the lower levels of this mine has been discontinued. The ore supply in the upper levels is immense.

Work at the Reed and Benson is prosecuted with vigor. The tunnel is being pushed ahead night and day. It will tap the mine at a depth of 1,200 feet. They work a force of 30 men, and are shipping some very fine ore.

The Empire Tunnel company are building a boarding-house for their men. They intend to work a strong force. The boys at the Iris tunnel are hard at work, likewise at the Siskiyon.

I never give you the number of men employed on the Grizzly, but they seem to be pushing the work energetically.

The Hudson River tunnel is looking well, and its owners believe they are working their way into the best mine on the hill.

Work will soon commence on the Lumber Boy. A large body of first-class ore has been struck near the Flagstaff. I think that a thousand sacks of good ore on the dump; a very fair showing for the short time the boys have been at work.

## Transportation of Fruit.

A very important matter in connection with the fruit growing interests of this State, which, though already large, are daily increasing, is that of proper and perfect means of transportation for the products. The home market is comparatively limited, while that of the Eastern States offers excellent advantages, both in prices realized and almost unlimited demand. When Californians think of the great quantity of fruit which is here fed to the hogs, or left to rot for want of a market, even those not familiar with the business will recognize the necessity and advantage of appliances to carry the fruit, in a fresh condition, to distant markets.

A number of refrigerator cars have been invented for this special purpose, but the difficulty has been to keep the fruit dry enough in the presence of the ice to preserve it for any length of time. The absence of moisture is an essential feature, and has been found to be indispensable—a fact which has not received the attention it deserved. We mentioned in our last issue the case of the recent loss of a valuable car-load of fruit which was sent on from here and spoiled by the time it got to Chicago.

We saw this week at the Central Pacific railroad depot, a refrigerator car belonging to the Western Refrigerator Company, of San Francisco, which was designed to overcome the difficulties attending the shipment of fruit, and is now being loaded with fruit for New York. The car has made two trips from here with fruit and was found to be successful in preserving the fruit. The expense attendant on drawing these cars with the passenger trains is so great as to materially reduce the profits, and therefore this car is intended to be taken by the freight trains, although the trip consumes twice the time. This car is constructed with passenger trucks and Miller platform, and on top is fitted with doors to charge the proper receptacle with ice. The sides of the cars are provided with doors for the preserving chamber for packing and loading purposes. When building the car the inventor sets apart a six inch space surrounding the top, bottom and sides, as also the top and side doors, which he packs with a light and effective non-conductor (charcoal), impervious to the extreme heat of summer and the cold of winter, and the car is lined with No. 28 galvanized iron. Each of the top and side doors have triple closing edges like those of an iron safe, fitted with rubber weather strips, so that when the doors are closed and the patent screw cap on the outside is applied to the thread of the longitudinal latch-bar on the inside, it draws the door and the jam so closely and firmly together that no particle of air can enter the preserving chamber of the car, unless it is permitted to enter through the ventilator, which is only opened at the will of the consignee of a load of perishable matter and under his instructions or orders.

Inside of the car and attached to the top is properly secured an air-tight, V-shaped, galvanized iron receptacle or trough, which holds about one ton of ice. This receptacle, owing to its gutter form, prevents the water from the melting ice coming in contact with the sound ice, and as it melts, the water being facilitated by the gutter form of the lower part of the receptacle, passes out through an iron pipe extending through the bottom of the car, this cup being trapped at the lower end to prevent the admission of air.

The small gutter which runs below the V-shaped receptacle carries off the moisture which may be contained in the provision chamber and condenses on the surface of the ice box. Whatever hot air there may be has no chance to come in contact with the ice and melt it, so that economy in the use of ice is obtained. In other cars which we saw at the depot the ice was exposed to the contents of the cars in such a manner that it was liable to melt very rapidly and also added to the moisture in the car, instead of condensing it as in this case, which has been proved very injurious to fruit.

Last fall a car of this pattern was built at the Central Pacific works at Sacramento and left Sacramento for St. Louis on the 27th of October, loaded with California grapes, chiefly of the Muscat and Tokay varieties. The car also contained a few boxes of strawberries, pears and several boxes of tomatoes, celery and other vegetables for a test in this line. The St. Louis Republican of the 5th of December said: "On Oct. 27th this car, loaded with fine California grapes, etc., in boxes, left Sacramento by passenger train and arrived here a week later. Since that time it has been kept iced up and the preserving chamber opened daily for the removal of fruit for sale, and to-day the grapes are as sound as the day they were picked."

The company owning this car have established an office over the Grangers' Bank, No. 40 California street, and are now purchasing fruit for shipment to the East. It is their intention to continue this business and they now have seven cars employed. The success which has attended the experiment so far encourages them in the belief that they have solved the difficult question of fruit transportation for long distances, and the fact that they have embarked in the business themselves shows their faith in the results.

## Distinguished Botanists Coming.

EDITORS PRESS:—You kindly request botanical notes from me this season. Here is one. A letter just received from Dr. Gray, at Harvard University, Cambridge, Mass., announces: I have just read your articles in the Press, "Honorary Names in Science" and "Webber Lake." Many thanks. I can now tell you something that will please you. Dr. Hooker—now Sir Joseph Hooker, but none the better for that—is expected here about the 8th of July. We are going to Colorado and the Rocky Mountains together for a summer vacation, and may, late in August, get over to California. If so, we will come over from Truckee and see you and put up at the Webber hotel," etc. It may not be known to all your readers that Sir Joseph Hooker is the curator of the botanical gardens at Kew, Eng., the most extensive known; that he is the President of the Royal Society of England and the most renowned botanist in the world; also that Dr. Asa Gray is in charge of the botanical gardens at Cambridge, Mass., the most extensive in America, and that he is the most renowned botanist in the new world. These distinguished personages will perhaps be joined at St. Louis by Dr. Geo. Engelmann, the American authority on forest trees and several obscure genera; and at Davenport, Iowa, by the genial and sharp-eyed little Dr. C. C. Parry, the same who last season explored an Southern California and made a flying visit to Webber lake and the Sierra valley in the high Sierra.

J. G. LEMMON.

Sierraville, Cal., July 7th, 1877.

We are glad to hear that these lights of science are coming. We have no doubt that this coast will please them and that our people will give them a cordial welcome. Not only in the romantic recesses of the high Sierra will they find fraternal spirits. Our city men of science are preparing to welcome the visitors and to hear the sound of their voices before our Academy of Sciences. In addition to the tidings which Prof. Lemmon sends us of the prospective arrival, we have fuller details in the associated press telegrams of the present week. A dispatch from Washington, dated July 8th, says: Dr. J. D. Hooker, President of the Royal Society of London, director of the Kew botanical gardens, etc., and Lieut.-Gen. Strachey, of the Royal Bengal Engineers, and a member of the Council for India, have made arrangements through friends in Washington and elsewhere for a tour of scientific research this summer in Colorado, Utah and California, in company with Asa Gray, of Cambridge, the distinguished botanist, and Prof. Joseph Leidy, of Philadelphia, an eminent comparative anatomist, the result of which will be communicated in the form of reports to our Government. Dr. Hooker's position as President of the Royal Society has for a number of years made him the chief adviser of the crown in all scientific matters pertaining to the government, and on the Queen's last birthday he was knighted in consideration of his eminent scientific services. He is also corresponding member of the Institute of France. Gen. Strachey has been for many years a prominent member of the Royal Geographical Society, and is now President of the geographical section of the British Association for the Advancement of Science. He is author of several hooks of travel and has a world-wide reputation as a geographer. Mrs. Hooker and Mrs. Strachey will accompany their husbands. The former was the widow of Sir Wm. Jordan, an eminent naturalist, and Mrs. Strachey is the daughter of Sir J. R. Grant, formerly Governor of Bengal, and at a later period Governor of Jamaica. The party were to leave England about the 28th ult., with the expectation of proceeding directly to Boston. The results of this extended scientific tour, which has been thus arranged, will, it is believed, be of great interest and value, and these will be attained entirely at the private expense of the distinguished gentlemen who compose the expedition.

## Unemployed Miners.

The situation on the Comstock for laboring men is now, and has been, a very unpleasant one, to say the least. So many mines have closed down or reduced their working force that large numbers of miners are out of employment. The miners with families have a specially hard time of it, of course, and there is a great deal of distress among them. The different superintendents naturally do what they can in the way of giving these men employment, but there is not room for half of those desiring work. A laboring man addressed, through the *Enterprise*, an open letter to Col. J. G. Fair, and other superintendents, in which he says: "You know better than any one else the number of men who daily beg for work of you—men, too, who are as good workers as those you have in your mines. As you cannot employ all the men in the country at the same time without injury to your interests, and as you are not who does your work, provided it is properly done, then suppose there should be a draft, say once per month, of 80 or 100 men, and give their places to those who are actually in want of the necessities of life. This would give the needy a chance to help those depending on them, others to pay a few dues, and others still to leave the country. Those who are drafted are supposed to have money to leave the country, or live comfortably a few months. I don't think this is a selfish view of matters in Virginia. Should this be done in all the mines where new hands could do the work as well as old ones, which cannot be done in all places, the relief committee would soon find very little to do; women, then, would not beg for work for their husbands, to support their little ones. There is plenty of work in and around Virginia, if properly divided, to 'let live' every man,

woman and child in our midst, without beggary or want. I ask you candidly, could this not be done without prejudice or injury to your interest?"

In reply to this letter, Col. Fair told a Virginia *Chronicle* reporter that the ideas were not practicable for many obvious reasons. To turn off 80 or 100 old hands at once, every month, and replace them with an equal number of new men, would be injurious to any company's interests.

He said, however, that the object of relieving the needy can be accomplished better under the present system. In the first place, they favor married men as much as is possible and proper, and favor those whom they have reason to believe stand in greatest need. Col. Fair does not approve of the turn-about system proposed in the letter given above. He said: "I do not think that it would effect any improvement, and it might cause positive hardship in some cases. At present the best of feeling prevails among the miners. The young men have been acting in a very manly and generous way all through the dull spell. And they are doing so yet. Nearly every day some of the young fellows come forward and volunteer to quit work for a week, or two weeks, or a month, so as to give unemployed men a chance. This is done to a far greater extent than you can imagine. Now, a relief system of that kind promotes good feeling among the miners. The man who gives up his place of his own accord probably feels better about it than the man who takes his place; whereas, if the thing were compulsory, as that letter writer proposes, there would be bitter feelings on one side and no thanks on the other." Col. Fair said, furthermore, that the number of unemployed men was not by any means so great now as a few weeks ago, and he hoped to see everybody at work before long.

Comment on the voluntary relief system spoken of by Col. Fair is superfluous. When men are willing to sacrifice their own interests for those of others, in the cause of humanity, as is done in this case, they do the most honorable and praiseworthy act possible. Generosity of this kind seldom occurs except in isolated instances, and it is a compliment to the mining community higher than any other that could be paid them to have it said that they have acted in this generous manner. Miners are proverbially generous and manly, and we feel proud to represent the interests of a class with such noble characteristics.

## General News Items.

MEXICAN marauders have been chased over the Rio Grande by U. S. troops.

THE famine district in British India is daily doing better. Rain has fallen plentifully and sowing has begun. The position in Madras is still grave, and over 1,000,000 persons are fed by the relief works.

ADVICES from Peru state that in consequence of the attack by the British war vessels *Shah* and *Amethyst* on the Peruvian ram *Huascar*, the President has issued a proclamation, in which he declares that he will exact from Great Britain explanation and satisfaction, consequent on such wanton outrage on a friendly power.

THE Secretary of the Treasury gives notice that \$7,000,000 coupons of 5-20 bonds, under the Act of March 3d, 1865, and consols of 1865, will be paid at the United States Treasury on and after October 5th, when interest ceases; also \$3,000,000 registered bonds of the same issue.

THE silk manufacturers of Paterson are about to begin action against the strikers. They had written contracts, in which they bound themselves to finish all warps on which they had begun before engaging in the strike. When the recent strike occurred, a large number of strikers left work without finishing their warps.

THE President is so well satisfied that there is no further need for troops in the South, that he will shortly direct the issuing of orders to withdraw all troops from that section except such as may be necessary for garrison duty. The troops so withdrawn will either be transferred to service in the West or be sent to the Rio Grande. The order already issued transferring the Second Infantry from Atlanta to the Pacific coast is in pursuance of this determination.

THE sectional dry dock at the Navy Yard broke down last week while trying to take out the French man-of-war *Linnier*. The docks are old and have been out of repair for the past three or four years. There was no damage done to the ship. It will require many thousand dollars to repair the dock. The Department at Washington has been repeatedly asked for money to repair the sections, and such an accident as has happened has been predicted by the yard authorities.

THE *Sentinel* has telegrams from points in Minnesota, Iowa and Dakota, which report grasshoppers in large numbers flying with the wind. In Minnesota the hoppers are flying north, only a few lighting. At the points heard from in Minnesota, the hoppers are doing no damage. Farmers are encouraged by the crop prospect, in some places expecting average crops. A dispatch from Sauk Center, Minn., says that if no more boppers arrive they will harvest about half a crop. In Dakota, about 10% of the wheat crop is ruined. On the whole the report is favorable.



## Mining Suits.

A case was commenced in the Fifteenth District Court on the 3d inst., involving the distribution of a very important mining interest. The suit is brought by Early Hubbard against B. W. Regan, the Silver King mining company and James N. Barney.

According to the allegations set forth in the complaint, Hubbard and Regan, as partners in prospecting and speculation in Arizona, acquired possession of one-half of the Silver King claim and other valuable mining interests. The Silver King is believed to be one of the richest mining claims in the Territory, the up-set price of the half interest being fixed at half a million. This spring the two partners came to San Francisco for the purpose of negotiating a sale of the Silver King or organizing a company. The latter expedient was acted upon, and the company was incorporated with the following Trustees: J. M. Barney, B. W. Regan, G. L. Woods, B. J. Barney and W. H. Booth. The whole property was then deeded to the company, with certain stipulations regarding an equitable distribution and disposal of the stock. About the 1st of June Regan assumed to own one-half of the mine and ignored his partner as a mere employee and fixture. In pursuance of this policy he represented to Hubbard that the other stockholders in the mine were bankrupt and that there was danger of losing the whole interest, and Hubbard was persuaded to consent to a board of arbitration to settle the difference. The board selected, as intimates in the complaint, was in the interest of Regan specially. The arbitrators decided that Hubbard should relinquish his claim in the Silver King to Regan for the consideration of \$5,000. Hubbard, supposing the proceeding to be final and binding, yielded and accepted notes for the amount specified, payable in six months. Subsequently Hubbard became convinced that fraud had been practiced upon him.

Hubbard is represented in the complaint to be an illiterate person, without knowledge of law or commercial customs, and entirely pliable to those in whom he reposes confidence. The suit is for the dissolution of the partnership between Hubbard and Regan; an equal division of their mining interests; to vacate and set aside the arbitration and award mentioned; to annul the deeds which Hubbard was induced to sign misunderstandingly, as alleged; to enjoin Regan during the pendency of the action from disposing of or disturbing in any way the partnership property; to enjoin the Silver King mining company from issuing any stock to Regan, and to enjoin Barney from paying out any funds presumed to have been placed in his hands by Regan. Meantime a restraining order has been issued by the Court.

Judge Wheeler has issued an injunction, on complaint of P. J. Ryan, restraining the sale of stock of the Cornucopia G. & S. M. Co., delinquent for the second assessment. The dissatisfied stockholders aver that William M. Pierson, George R. Gibson, George H. Willard, M. J. McDonald and E. J. De Crano, on the 2d of May, usurped the office of Directors of the company affairs, and that on the 10th of May these pretended Directors levied an assessment of 5 cents per share on each and every share of the capital stock of the company; that of a previous assessment amounting to \$10,000, not more than \$2,000 has been expended, and therefore the second assessment is unnecessary. The complaint further alleges that \$3,000 of the first assessment has not been paid. The plaintiff prays that the books, papers and other effects of the company he delivered to the old Board of Directors.

## Meetings and Elections.

**GREAT EASTERN CON. QUARTZ M. Co.**—July 9: Trustees: H. H. Pearson, J. B. Low, J. A. Riley, F. A. Brin, J. H. Griffith. Officers—H. H. Pearson, President; J. C. Riley, Secretary.

**UTAH M. Co.**—July 10: Trustees: R. H. Follis, John Skae, George Wallace. Officers—R. H. Follis, President; John Skae, Vice President; Geo. C. Pratt, Secretary. James Fair, Superintendent. The deficiency is \$741.07.

**MONOC CO. M. Co.**—July 10: Trustees: Henry Williams, W. C. Parker, Robert Gardiner, Joseph Sharon. Officers—J. Sharon, President; E. F. Dickens, Secretary; W. E. Strouach, Superintendent.

**CHOLLAR POTOMI M. Co.**—July 10: Trustees: A. K. P. Hammon, J. D. Fry, C. L. Weller, J. H. Robinson, Joseph Sharon, Alpheus Bull, Wm. Morris. Officers—A. K. P. Hammon, President; J. D. Fry, Vice President; W. E. Dean, Secretary; J. L. Requa, Superintendent.

**MAT. CANAVAN** has resigned the position of Superintendent of the Dayton, and T. B. Perkins has been appointed in his place.

**BEST & BELCHER.**—July 9: Trustees: W. S. O'Brien, S. Heydenfeldt and George Wells. Officers—Robert Sherwood, President; George Condon, Vice President; F. F. Osbiston, Superintendent; William Willis, Secretary.

## New Incorporations.

The following companies have filed certificates of incorporation in the County Clerk's office at San Francisco:

**WILDMAN M. Co.**—July 7: Location, Amador Co. Capital stock, \$5,000.00. Directors—P. F. Cronise, John Truglio, J. T. Glover, C. A. Richmond and Alexander Forbes.

**GREEN MOUNTAIN M. Co.**—June 9: Location, Kern Co. Capital stock, \$25,000.00, in 50,000 shares. Directors—H. H. Lee, Geo. S. Fife, Wm. Spangle, C. B. Higgins and S. M. Holmes.

**DEBBEE BLUE GRAVEL M. Co.**—July 10: Location, Nevada Co. Capital stock, \$10,000.00. Directors—G. Dursol, E. Bostup, P. Metroy, L. Duterte and H. Barroilhet.

**CALIFORNIA PAPER CO.**—July 11: Object, to manufacture and sell paper: Capital stock, \$300,000. Directors—Egbert Judson, Albert Dibbee, Henry Pierce, Bartlett Dow, W. C. Talbot, R. B. Lane and B. J. Field.

**WOODWARD'S GARDENS** has the following new attractions: The buffalo chase; large whale skeleton; new museum; improvement in the zoological department, besides the other features which have made it popular.

## Signal Service Meteorological Report

Week Ending July 10, 1877							
HIGHEST AND LOWEST BAROMETER.							
July 4	July 5	July 6	July 7	July 8	July 9	July 10	
29.98	30.02	30.00	29.95	29.94	30.00	29.97	
29.90	29.90	29.91	29.91	29.90	29.91	29.87	

MINIMUM AND MAXIMUM THERMOMETER.							
July 4	July 5	July 6	July 7	July 8	July 9	July 10	
64	63	67	66	63	63	66	
54	54	53	54	53	53	53	

MEAN DAILY HUMIDITY.							
July 4	July 5	July 6	July 7	July 8	July 9	July 10	
74	74	73	80	85	81	73	

PREVAILING WIND.							
WSW	SW	W	SW	WSW	WSW	W	
307	283	326	277	344	350	330	

WIND—MILES TRAVELED.							
WSW	SW	W	SW	WSW	WSW	W	
307	283	326	277	344	350	330	

STATE OF WEATHER.							
Fair	Fair	Clear	Clear	Fair	Fair	Clear	

RAINFALL IN TWENTY-FOUR HOURS.							
Fair	Fair	Clear	Clear	Fair	Fair	Clear	

Total rain during the season, from July 1, 1877, 0.00 in.

## METALS.

WHOLESALE.

THURSDAY, M., July 12, 1877.

IRON.			
American Pig, ton.	32.00	@	33 00
Scotch Pig, ton.	32.00	@	34 00
White Pig, ton.	31.00	@	32 00
Oregon Pig, ton.	31.00	@	32 00
Refined Bar.	31.00	@	32 00
Horse Shoes, keg.	5.00	@	5 00
Nail Rod.	—	@	7 00
Nail, Oval.	—	@	7 00
Rolled.	—	@	7 00
COPPER.			
Copper Tinned.	37.00	@	40 00
Sheathing, Yellow.	37.00	@	40 00
Sheathing, Old Yellow.	10.00	@	11 00
Composition Nails.	21.00	@	22 00
Composition Bolts.	24.00	@	25 00
STEEL.			
English Cast, lb.	14.00	@	25 00
Anderson & Woods, ordinary sizes.	16.00	@	—
Drill.	16.00	@	—
Flat Bar.	15.00	@	20 00
Flat Bar.	8.00	@	12 00
TIN PLATES.			
10x14 C. Charcoal.	9.00	@	50 00
Bacon Tin.	24.00	@	25 00
Australian.	19.00	@	20 00
ZINC.			
By the Case.	11.00	@	—
Zinc Sheet 7x3 ft. 7 to 10, lb.	11.00	@	—
7x3 ft. 11 to 14.	12.00	@	—
8x4 ft. 8 to 10.	12.00	@	—
8x4 ft. 11 to 10.	12.00	@	—
NAILS.			
Assorted sizes.	3.25	@	37 1/2
By the lb.	41.00	@	42 00

## GENERAL MERCHANDISE.

WHOLESALE.

WEDNESDAY M., July 11, 1877.

RAGS—Jobbing.			
Eng Standard Weaving.	9 1/2	@	—
Neville & Co's.	—	@	—
Hand Sewed, 2x3x6.	9 1/2	@	—
2x3x6.	—	@	—
Machine Sewed, 2x3x6.	9 1/2	@	—
Flour Sacks, halves.	9 1/2	@	—
Quarters.	5 1/2	@	6 1/2
Lighting.	4 1/2	@	5 1/2
Head, 50 lb.	13 1/2	@	—
45 lb.	7 1/2	@	8 1/2
40 lb.	7 1/2	@	8 1/2
WOOL SACKS.			
Hand Sewed, 3 1/2 lb.	47 1/2	@	50 00
Machine Sewed.	45	@	—
4 lb.	55	@	—
Standard Gunnies.	14	@	15 00
Bean Bags.	8	@	9 00
CANNED GOODS.			
Assorted, 1 lb.	2 1/2	@	3 00
Table oil.	3 1/2	@	4 25
Jams and Jellies.	4 25	@	—
Pickles, 1 gal.	5 50	@	—
Sardines, 1/2 doz.	6 50	@	—
Hf Boxes.	3 00	@	—
COAL—Jobbing.			
Australian, ton.	9 00	@	25 00
Coke Bay.	8 00	@	—
Bellingham Bay.	8 00	@	—
Seattle.	8 00	@	9 00
Cumberland.	14 00	@	17 00
Mt. Diablo.	7 50	@	7 75
Lehigh.	22 00	@	—
Liverpool.	8 50	@	9 00
West Hartley.	14 00	@	—
Coke.	7 50	@	8 00
Charcoal, sack.	75	@	—
Coke, blk.	60	@	—
COFFEE.			
Sandwich, 2 1/2 lb.	21 1/2	@	—
Costa Rica.	18	@	20 00
Guatemala.	18	@	20 00
Java.	24 1/2	@	—
Manilla.	25	@	19 1/2
Ground, in sacks.	25	@	—
FISH.			
Sect to Dry Cod.	5	@	6 00
Bonellus.	8 1/2	@	10 00
Eastern Cod.	7 1/2	@	8 00
Salmon, bls.	8 00	@	9 50
Hf bls.	4 50	@	5 00
2 lb cans.	3 00	@	—
Pkld Cod, bls.	22 00	@	—
Hf bls.	11 00	@	—
Mackerel, No. 1.	14 00	@	15 00
Hf Bls.	14 00	@	15 00
In Kits.	3 00	@	3 25
Ex Mess.	3 50	@	4 00
Plate Herr.	3 00	@	3 25
Boston Smk'd Hg.	40	@	50 00

LIME, Etc.			
Lime, Sta Cruz.	2 00	@	2 25
Cement, Rose.	2 00	@	2 25
Portland.	4 75	@	5 00
Plate, Golden.	3 00	@	3 25
Land Plaster.	10 00	@	12 50
NAILS.			
Ass'd sizes, keg 3 25	@	4 00	

PAINTS.			
Pure White Lead.	9 1/2	@	10 1/2
Whiting.	14 1/2	@	—
Black.	14 1/2	@	—
Chalk.	14 1/2	@	—
Paris White.	24 1/2	@	—
Ochre.	34 1/2	@	—
Venetian Red.	34 1/2	@	—
Downy Mixed.	—	@	—
Paint, gal.	—	@	—
White & tints.	2 00	@	2 40
Green, Blue & Yellow.	3 00	@	3 50
Light Red.	3 00	@	3 50
Metallic Roof.	3 00	@	6 00
RICE.			
China No. 1, lb.	5 1/2	@	6 1/2
Hawallah.	4 1/2	@	5 1/2
SOAP.			
Cal. Bay, ton.	13 00	@	14 00
Common.	6 00	@	8 00
Carmen Id.	13 00	@	14 00
Liverpool.	15 00	@	16 00
SUGAR, ETC.			
Cal. Cube, lb.	13 1/2	@	—
Powdered.	13 1/2	@	—
Fine crushed.	13 1/2	@	—
Granulated.	13 1/2	@	—
Golden C.	10 1/2	@	11 1/2
Hawallah.	10 1/2	@	—
Cal. Syrup, kgs.	75	@	—
Hawallah Molasses.	25	@	30 00
TEA.			
Young Hyson.	35	@	50 00
Moynse, etc.	35	@	50 00
Country pkd Gunpowder & Imperial.	50	@	60 00
Japan, 1st quality.	30	@	35 00
2d quality.	25	@	35 00

## Gold, Legal Tenders, Exchange, Etc.

[Corrected Weekly by SMITH &amp; CO.]

SAN FRANCISCO, July 11, 3 P. M.	
LEGAL TENDERS IN S. F., 11 A. M., 95 1/2. SILVER, 40 1/4.	
Gold in New York, bankers' 137. Commercial, 49 1/2. Premium, five francs \$1 dollar; Mexican dollars, 94 1/2.	
LONDON CONSOLS, 94 1/2. Bonds, 107 1/2.	
QUICKSILVER IN S. F., by the flask, 42 @ 42 1/2.	

## LEATHER.

WHOLESALE.

WEDNESDAY M., July 11, 1877.

Sole Leather, heavy, lb.			
Light.	26	@	29 00
Jodot, 5 Kil, doz.	48	@	50 00
11 to 13 Kil.	53	@	55 00
14 to 19 Kil.	52	@	54 00
Second Choice, 11 to 16 Kil.	57	@	60 00
Cornellian, 12 to 16 Kil.	57	@	60 00
Females, 12 to 16 Kil.	53	@	55 00
14 to 16 Kil.	51	@	55 00
Simon Ulmo, Females, 12 to 16 Kil.	58	@	60 00
14 to 15 Kil.	56	@	60 00
16 to 17 Kil.	72	@	74 00
Simon, 18 Kil.	51	@	55 00
20 Kil.	55	@	60 00
24 Kil.	72	@	74 00
Robert Calif, 7 and 9 Kil.	35	@	40 00
Best Jodot, Calif.	1 00	@	1 50
Cal. doz.	40	@	60 00
French Sheep, all colors.	8 00	@	15 00
Eastern Calf for Backs, lb.	1 00	@	1 25
Best Jodot, Calif.	8 00	@	13 00
For Lining.	5 50	@	10 00
Cal. Bussat Sheep Linings.	1 75	@	4 50
Boot Legs, French Calf, pair.	4 00	@	—
Good French Calf.	4 00	@	4 75
Wolk, 6x2.	30	@	35 00
Leather, Harness, lb.	35	@	38 00
Pair Bridle, doz.	48	@	72 00
Skirting, lb.	53	@	57 00
Wolk, 6x2.	30	@	35 00
Buff, ft.	18	@	20 00
Wax Side.	17	@	18 00

## LUMBER.

WEDNESDAY M., July 11, 1877.

CARGO PRICES.		OF PUGET SOUND PINE.	
REDWOOD.		RETAIL PRICE.	
Rough, M.	14 00	Rough, M.	18 00
Refuse	10 00	Pending	18 00
Clear	24 00	Flooring and Step.	28 00
Clear Refuse	14 00	Narrow	28 00
		24 quality	25 00
Rustic	27 50	Laths	3 50
Refuse	20 00	Purring, lineal ft.	
Surfaced	24 00		
Refuse	14 00	REDWOOD.	
Flooring	26 00	Rough, M.	18 00
Refuse	14 00	Refuse	15 00
Beaded Flooring	26 00	Pickets, Rough.	18 00
Refuse	14 00	Pointed	20 00
Half-inch Siding	20 00	Fancy	25 00
Refuse	15 00	Siding	32 50
Half-inch Surfaced	20 00	Surfaced & Long Beaded	30 00
Refuse	15 00	Flooring	32 50
Half-inch Battens	18 00	Refuse	22 50
Pickets, Rough	14 00	Half-inch Surfaced	32 50
Rough, Pointed	14 00	Rustic	32 50
Fancy, Pointed	18 00	Battens, lineal ft.	
Shingles	2 00	Shingles, M.	2 25



## Iron and Machine Works.

### PACIFIC ROLLING MILL COMPANY,

SAN FRANCISCO, CAL.

Established for the Manufacture of

RAILROAD AND OTHER IRON

—AND—

Every Variety of Shafting,

Embracing ALL SIZES of

Steamboat Shafts, Cranks, Piston and Connecting Rods, Car and Locomotive Axles and Frames,

—ALSO—

Hammered Iron of Every Description and Size.

Orders addressed to PACIFIC ROLLING MILL COMPANY, P. O. Box 2032, San Francisco, Cal., will receive prompt attention. Office: 16 First Street.

The highest price paid for Scrap Iron.

### THE RISDON

Iron and Locomotive Works,

INCORPORATED.....APRIL 30, 1868  
CAPITAL.....\$1,000,000.

LOCATION OF WORKS:

Corner of Beale and Howard Streets,  
SAN FRANCISCO.

Manufacturers of Steam Engines, Quartz and Flour Mill Machinery, Steam Boilers (Marine, Locomotive and Stationary), Marine Engines (High and Low Pressure). All kinds of light and heavy Castings at lowest prices. Cams and Tappets, with chilled faces, guaranteed 40 per cent. more durable than ordinary iron.

Directors:

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Wm. Norris, Wm. H. Taylor, J. B. Haggin,  
James D. Walker.

WM. H. TAYLOR.....President  
JOSEPH MOORE.....Vice-President and Superintendent  
LEWIS R. MEAD.....Secretary

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### ÆTNA IRON WORKS,

MANUFACTURERS OF

### IRON CASTINGS

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OF ALL KINDS.

Fremont Street, Bet. Howard and Folsom

SAN FRANCISCO.

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HINCKLEY & CO.,

Manufacturers of

STEAM ENGINES,

Quartz, Flour and Saw Mills,

Hayes' Improved Steam Pump, Brodie's Improved Crusher, Mining Pumps, Amalgamators, and all kinds of Machinery.

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Risdon Iron and Locomotive Works

Corner Howard and Beale Streets,

Are prepared to make SHEET IRON AND ASPHALTUM PIPE, of any size and for any pressure, and contract to lay the same where wanted, guaranteeing a perfect working pipe with the least amount of material.

Standard sizes of Railroad Car Wheels, with special patterns for Mining Cars. These small wheels are made of the best Car Wheel Iron, properly chilled, and can be fitted up with the improved axle and box—introduced by this company, and guaranteed to outlast any other wheels made in this State.

All kinds of Machinery made and repaired.

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PRACTICAL BOILER MAKERS,

Marine, Stationary and Portable Boilers, Smoke Stacks, Hydraulic Pipe, Oil or Water Tanks, Ore and Water Buckets, Gasometers, Girders, Bridges and Iron Ship Building.

ALL KINDS OF SHEET IRON WORK.

Repairing promptly attended to at the lowest possible terms.

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ENGINES, BOILERS, MARINE AND STATIONARY. PUMPING, HOISTING AND MINING MACHINERY, INCLUDING BATTERIES, AMALGAMATING PANS AND SETTLERS, CONCENTRATORS, ORE FEEDERS, CRUSHING ROLLS AND ROCK BREAKERS. ALSO, WATER JACKET SMELTING FURNACES, FOR REDUCING LEAD, SILVER AND COPPER ORES, QUICKSILVER FURNACES, RETORTS AND CONDENSERS, ROASTING AND CHLORIDIZING FURNACES, SUGAR MILL MACHINERY, WATER WHEELS, Etc., ALL OF THE LATEST AND MOST IMPROVED CONSTRUCTION.

Agents for the Allen Engine Governor, Cook's Boiler Feeder and Heater, Buckminster Rock Drills and Air Compressors, Wheeler's Ore Breaker, Etc.

GEO. W. FOGG, Supt.

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IMPROVED PORTABLE

Hoisting Engines,

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ALL STYLES OF FANCY HEAD BOLTS.

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THOMPSON BROTHERS, EUREKA FOUNDRY, Light and Heavy Castings of Every Description Manufactured.

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All kinds of Brass, Composition, Zinc, and Babbitt Metal Castings, Brass Ship Work of all kinds, Spikes, Sheathing Nails, Rudder Braces, Hinges, Ship and Steamboat Bells and Gongs of superior tone. All kinds of Cocks and Valves, Hydraulic Pipes and Nozzles, and Hose Couplings and Connections of all sizes and patterns, furnished with dispatch. PRICES MODERATE. J. H. WEED. V. KINGWELL.

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Builders of QUARTZ, SAW AND FLOUR MILLS,

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## STEAM ENGINES AND BOILERS

Of all sizes—from 2 to 60-Horse power. Also, Quartz Mills, Mining Pumps, Hoisting Machinery, Shafting, Iron Tanks, etc. For sale at the lowest prices by

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## Miners' Foundry and Machine Works,

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Machinery and Castings of all kinds.

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BOILER MAKERS AND

GENERAL MACHINISTS,

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J. W. QUICK, MANUFACTURER,

SCREENS

Several first premiums received for Quartz Mill Screens, and Perforated Sheet Metals of every description. I would call special attention to my SLOTT CUT and SLOTT FENCED SCREENS, which are attracting much attention and giving universal satisfaction. This is the only establishment on the coast devoted exclusively to the manufacture of Screens. Mill owners using Battery Screens extensively can contract for large supplies at favorable rates. Orders solicited and promptly attended to.

32 Fremont Street, San Francisco.

## Machinery.

### The Ingersoll Rock Drill



Is Extensively Used in the East and

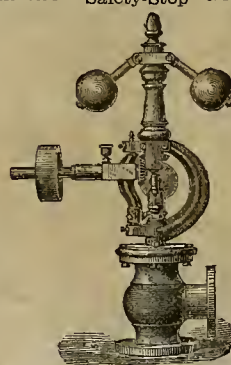
TAKES THE PLACE OF ALL OTHERS,

Wherever introduced, because it can be run with less power, labor and repairs, and do more work than any other Drill in the market. It has but few parts, is easily handled, being light, and has AUTOMATIC FEED, which saves labor. WE ASK FOR TRIAL AGAINST ANY COMPETITOR. For particular information regarding Drills or Air Compressors, send for circular to

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MORE THAN TEN THOUSAND NOW IN USE. EVERY ONE WARRANTED.



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## THE O'HARRA CHLORIDIZING FURNACE

Guaranteed to Chloridize from 85 to 95 per cent. of any gold or silver ores that are not more profitable for smelting. Will also desulphurize ores and put them in proper shape for working in cupola furnaces.

Cost of Roasting and Chloridizing 20 Tons in 24 Hours by this Process:

One man.....	\$ 4 00
One team.....	3 00
Wood—23 Cords at \$3 per cord.....	5 25
Salt—1,600 lbs at 24 cents.....	40 00
Cost of 20 tons.....	\$52 25
Cost of one ton.....	2 61 1/2

In a furnace of three or four times this capacity the cost is decreased by 20 per cent.

The furnace is now working successfully at the Poe Consolidated Co.'s mines, in Peavine District, Nev., and at the Exchequer mill, Alpine Co., Cal. For further information, apply to

D. J. O'HARRA, Reno, Nevada.

THE

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BRUCKNER'S PATENT REVOLVING FURNACE, For Chloridizing, Desulphurizing and Roasting Ores.

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STEAM ENGINES, SAWMILLS, SHAFTING, GEARING AND MINING MACHINERY.

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Having been engaged in furnishing these supplies since the first discovery of mines on the Pacific Coast.

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Assay Office and Chemical Laboratory,

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Deposits of bullion received, melted into bars, and returned made in from 24 to 48 hours.

Bullion can be forwarded to this Office from any part of the interior by Express, and returns made in the same manner.

Careful Analysis made of Ores, Metals, Soils, Waters, Industrial Products, Etc. Mines examined and reported upon. Consultations on Chemical and Metallurgical questions.

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21 First Street, 3 doors from Market, S. F

Ores worked by any process.

Ores sampled.

ASSAYING in all its branches.

Analysis of Ores, Minerals, Waters, etc.

WORKING TESTS MADE.

Plans furnished for the most suitable process for working Ores.

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## INSTRUCTIONS IN ASSAYING,

Chemical Analysis, Determination of Minerals, and use of the Blow-pipe.

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**BENTLEY MARCEDANT & CO.**  
MANUFACTURERS OF SUPERIOR  
UNIVERSAL WOOD WORKERS  
BAND SAWS, SCROLL SAWS  
PLANING & MATCHING MACHINES  
UNIVERSAL HAND JOINTERS  
MOLDING, DOVETAILING, BOWING, FRIEZING, SHAPING &  
SAND PAPERING MACHINES, PLANER KNIVES & MOLDING BITS  
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# AVERILL MIXED PAINT,

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THIS CELEBRATED PAINT IS MANUFACTURED BY THE

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THIS PAINT IS MIXED READY FOR USE.

THE PUREST WHITE, AND OF ANY DESIRED SHADE OR COLOR.

It will not peel, crack, nor chalk off, and will last twice as long as the best white lead, prepared in the ordinary way. Is cheaper, handsomer, more durable and elastic than the best of any other paint.

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"This Paint is quite different from paints in general use. \* \* \* Work which has been done with it, some of it exposed for years to the moist atmosphere of the sea-shore, establishes its great durability. \* \* \* It is mixed ready for use, easily applied, of great beauty, and economical."

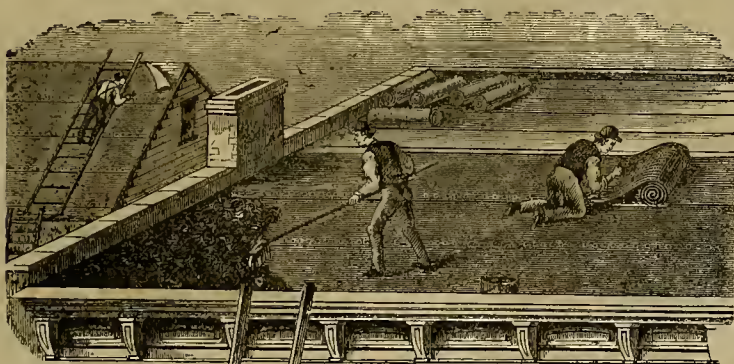
Extract From the REPORT OF THE FRENCH (CENTENNIAL) COMMISSION.

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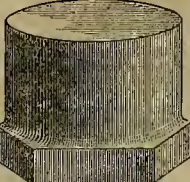
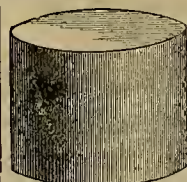
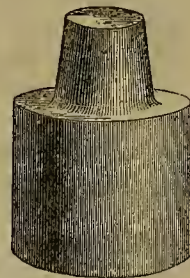
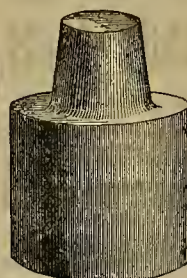
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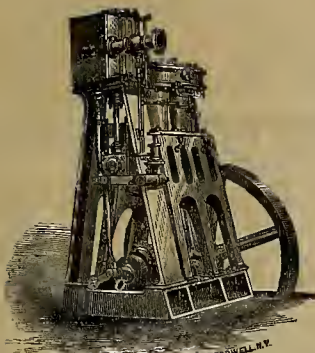
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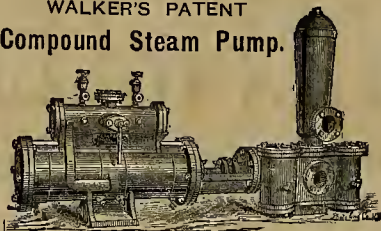
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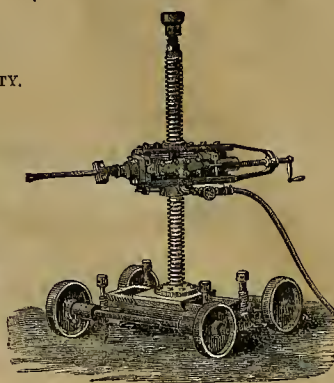
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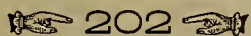
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We have just issued a pamphlet containing the General Mineral Land Laws of the United States, with instructions of the Commissioner of the Land Office. The contents of this pamphlet comprise all of the Government laws with relation to mineral lands of interest to the mining community, as follows: Mining Statute of May 10th, 1872, with Instructions by the Commissioner of the Land Office; Mining Statute of July 26th, 1866; Mining Statute of July 9th, 1870. Forms required under Mining Act of May 10th, 1872, as follows: Notice of Location; Request for Survey; Application for Patent; Proof of Posting Notice and Diagram of the Claim; Proof that Plat and Notice remained Posted on Claim during Time of Publication; Registers' Certificate of Posting Notice for Sixty Days; Agreement of Publisher; Proof of Publication; Affidavit of \$500 Improvements; Statement and Charge of Fees; Proof of Ownership and Possession in Case of Loss or absence of Mining Records; Affidavit of Citizenship; Certificate that no Suit is Pending; Power of Attorney; Protest and Adverse Claim; Non-Mineral Affidavit; Proof that no known Veins Exist in a Placer Claim, etc. There is also given the U. S. Coal Land Law and Regulations thereunder. The work comprises thirty pages, and will be sold, post-free, for 50 cents. It should be in the hands of every one having any mining interests. DEWEY & CO., Publishers of the MINING AND SCIENTIFIC PRESS, S. F.



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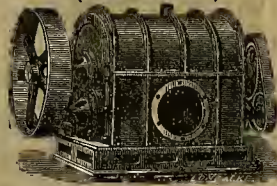
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# MINING AND SCIENTIFIC PRESS

An Illustrated Journal of Mining, Popular Science and General News.

BY DEWEY & CO.,  
Patent Solicitors.

SAN FRANCISCO, SATURDAY, JULY 21, 1877.

VOLUME XXXV.  
Number 3.

## A Hydraulic Gravel Elevator.

### An Important Appliance for Hydraulic Miners.

In almost every gravel mining country there are extensive beds of auriferous earth, sand, and gravel, which have not heretofore been made available, simply because no efficient system and apparatus have been devised for working them economically. In many instances the upper stratum of earth has been worked off at a fair profit, by existing methods and devices; but the expense of handling, removing and washing the material at a greater depth became so expensive, that the mines were abandoned, in the face of the well-known fact that the richest deposits of gold lie in the strata nearest the bedrock.

Many rich and extensive paying deposits lie in creeks, basins and flats too low to be worked by bedrock tunnels, cuts or drains, at any cost, and the only method by which they have been heretofore worked has been by the shovel, wheelbarrow, whim or derrick. This process being very slow and expensive, requiring in many instances pumps, engines and other machinery, to free the mines from water while being worked; rivers have been wing-dammed, turned and flumed and the remaining seepage water pumped out while the gravel has been removed by the old methods of the wheelbarrow and shovel.

Mr. Geo. W. Cranston has invented and patented through the MINING AND SCIENTIFIC PRESS Patent Agency, a device for overcoming some of these difficulties, which is illustrated on this page. It is not by any means an experimental appliance, but is at practical work in several places. It is not proposed with it to pump up rivers, yet after the surface water has been turned around, the machine is proposed to dispense with shovels, wheelbarrows and pumps, and work such mines as easy as those which have outlets for sluicing through.

It is a well-known fact to every hydraulic miner that water and gravel can be driven up hill by hydraulic force, and that it is only necessary to give water a greater velocity in a flume to make it carry more gravel. Miners, to accomplish this, give their flumes more grade.

Now, the inventor has discovered that it is only necessary to give water a little more velocity than it travels in an ordinary flume in order to make it carry gravel up hill. To accomplish this, and impart the required velocity to the water and gravel, a closed flume is constructed on an inclination upward, with a horizontal ground section made of cast iron, and a hydraulic nozzle introduced into a chamber in the ground section of the machine, and the nozzle pointed in the direction it is desired to make the water go. (See Fig. 2.) This ground section has an open end, back or behind the nozzle. There the water and gravel enters the machine.

The open end is connected with the flume, placed in the bottom of the mine, and the gravel is washed or driven into this flume in the ordinary way of mining. Between this flume and the open end, or throat, of the machine, is placed a grizzly or grating, that turns off to one side any large boulders, too large to pass through the throat of the machine. At the opposite

end of this ground section they connect the upward inclined closed flume, and also connect it at its upward end with the flume at the top of the mine, so as to discharge the material and water elevated into this flume placed on top. (Fig. 1.)

In order to operate this machine, the water is turned on under pressure, into the hydraulic pipe, connected with the nozzle, which discharges inside the chamber of the ground section of the machine. They then turn the water on the two monitors that drives the gravel into the flume in the bottom of the mine.

It will be evident, from the above description, that if there is sufficient force exerted by the water discharged from the hydraulic nozzle of the machine to drive and lift the material

The water discharged by the hydraulic nozzle elevator operates both to thin the material and water when it enters, and to drive it at the same time up through the elevator spout. This disintegration and washing process above alluded to, produced by the hydraulic force of the nozzle of the machine, so thoroughly washes and dissolves the gravel, in its upward passage through the elevator spout, that the inventors claim that expensive long flumes for washing are not necessary, the gravel being washed better in a single passage through this machine than in traveling one-half mile through an ordinary flume.

The process of employing under-currents is new and possesses several advantages. They are placed a short distance down the flume from

where the spout discharges to allow the surface water to become settled a little. They cut away the side of the flume next to the settling tank and place bars lengthwise, at short intervals apart, across the opening made in the flume. The surface water of the flume, containing but little gravel, flows over into the settling tank. The bars prevent the gravel and boulders from flowing over with the water and keep them in the main flume. (See O, Fig. 1.)

This settling tank has two compartments. The surface water from the compartment next to the flume, after it has settled, flows over into an outer compartment, where it is led back by pipes or otherwise into the mine to wash the gravel into the machine. (See AAA, Fig. 1.)

This tank is provided also with sliding gates next to the flume, to regulate the amount of water drawn from the main flume, so that no more water is allowed to run in the flume than is necessary to carry the gravel through to the dump.

The compartment of the tank, next to the flume, where the gravel settles, has a gate at the bottom to draw off the gravel collected in the tank, and has a small spout or flume to convey it off down, where it can be discharged into the main flume again. This gate can be closed and the gravel drawn off when the box gets full, or can be left partially open, so that the gravel is drawn off as fast as collected.

It will be evident that the greatest amount of wear will be on the ground section and curves, so these parts are made in sections so as to be easily repaired. The machine is made so as to be worked with an irregular head of water.

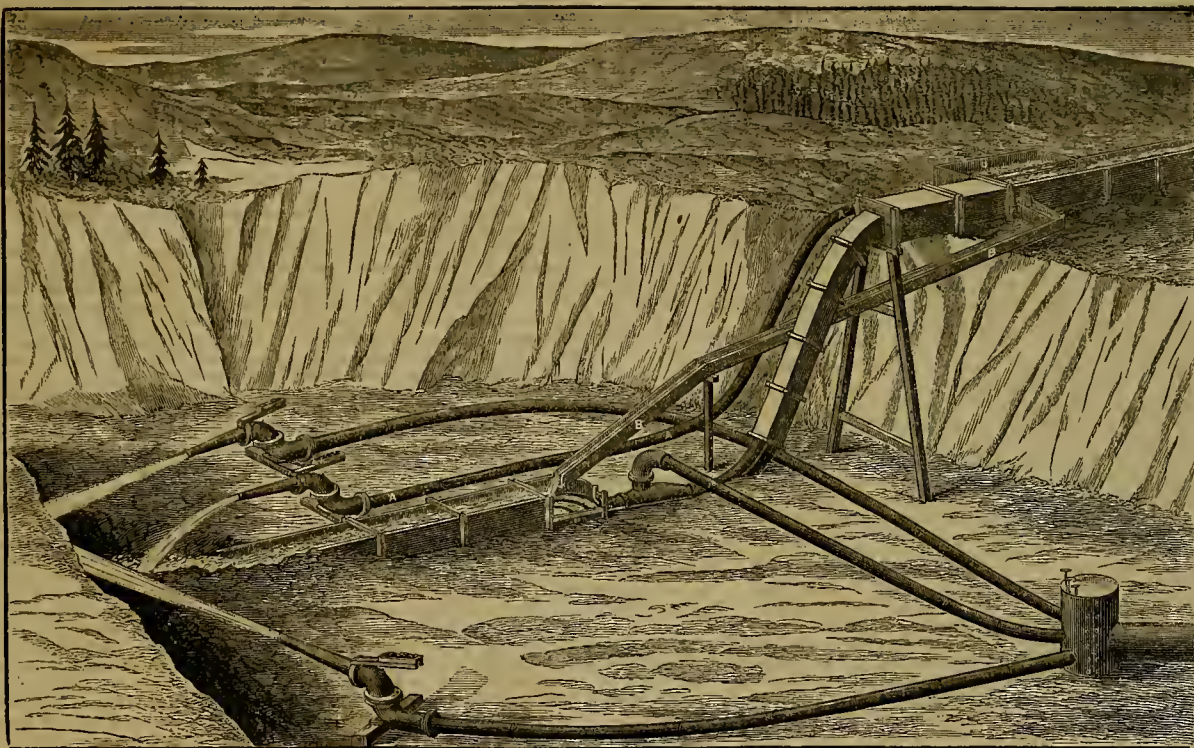
The machine is simple of construction, having neither belts, wheels, pulleys, valves

nor hockets—nothing to get out of repair, and nothing complicated. It can be run by any one, and is really a great improvement. It sluices water and gravel uphill, works mines that have no dump, saves bedrock tunnels, open cuts and drains; works as good as a flume of 10 or 12-inch grade, and will handle as much gravel in proportion to the water used. It can be made of any capacity. Wherever hydraulic pressure can be had, say 100, 200 or 300 feet, a mine can be worked to as good advantage 20 to 50 feet deep as through an open cut or tunnel.

This machine is successfully working at the American Flat claim at Fiddletown, Amador Co., at Canyon Creek, Oregon and at several other places.

Five sizes of this elevator are made. A 12-inch machine, the smallest, carries 300 inches of water and gravel in the sluice head; the largest, a 28-inch machine, carries 1,500 inches of water and gravel in the sluice head. The driving water is always returned to the mine and used for washing the gravel into the machine. A model machine can be seen at work any time in the city, at the office of the agent, J. Hendy, corner of Fremont and Mission streets.

THE Bonanza mines produced in June \$2,962,069, of which 47.77 per cent. is gold. California produced \$1,567,931, of which \$773,972 was gold and \$793,959 silver. Consolidated Virginia produced \$1,394,678, of which \$641,278 was gold and \$754,500 was silver. The Consolidated Virginia amount is \$153,000 in excess of that of the month of May.



CRANSTON'S HYDRAULIC ELEVATOR FOR GRAVEL MINING.

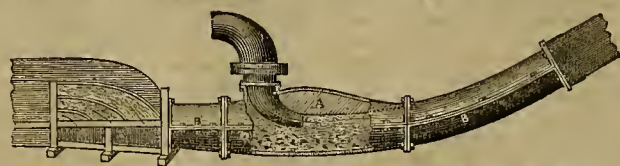
coming through the flume and into the throat of the machine and carry it through the upward inclined spout, and discharge it into the flume on top, that earth, sand, gravel and rocks entering the machine must necessarily be carried along and discharged with the water into the flume on top. The water, gravel and material is thus made to travel through the machine at high speed by the direct action of the hydraulic force, exerted by the nozzle of the machine. All of the gravel and material comes in direct con-

tact with the stream of water discharged from this nozzle, consequently it serves greatly to dissolve and pulverize all gravel that is hard and difficult to wash.

The gravel must pass through the machine at a high rate of speed, which is absolutely necessary to make it work. The gravel never chokes or lodges when the machine is working under pressure. Gravel and water have been run through this machine, by actual test, as thick as the water will carry the gravel through a flume on twenty-four inches grade, and it was impossible to choke the machine by any head of water it was calculated to carry.

machine, thus mixing, agitating and intermingling with the gold and other materials, as it is passing through the machine in an endless returning current. This under-current is placed so near the head of the flume that it saves most of the gold, and can be cleaned up every day, if desired, without stopping the machine or waiting for a long run before cleaning up.

In order to recover the elevating or driving water, which is discharged by the nozzle of the machine, and utilize it for washing the gravel in the mine into the machine, they construct a settling tank on the side of the flume on top of the mine, just far enough down the flume from



SECTIONAL VIEW OF HYDRAULIC GRAVEL ELEVATOR.



## CORRESPONDENCE.

### El Dorado Mines.

[From Our Regular Correspondent.]

El Dorado is yet a gold-producing county, although the high reputation it has attained for fruit has led many to suppose the mines were entirely neglected. Even this year, with the great lack of water and general depression, the mining does not fail to add something to the world's life arteries.

Good pay is being taken out right in the heart of the city of Placerville, and the probability is that the main street will yet be worked over and the gold secured, and at the same time a good sewerage drain can be laid down.

The sound of the hydraulic mining can be heard for miles away, so great is the force and concussion of the water as it bores into the gravelly banks. Placerville being the county seat and beautifully located amid these hills that are mostly occupied with neat residences, holds on to its vigor well and is yet a very stirring little city, making a mercantile, mechanical, social, religious and educational center of value to all the surrounding country. Its neighbor,

### Diamond Springs,

As a place of business or town, is dead and buried, and only the stately walls, with the strong iron doors of the many deserted buildings, attests its former greatness. It now contains two hotels, two stores, saloon, and some good residences.

There is yet some mining going on.

### The Church-Union M. Co.,

Three miles south, has been operating about one year. Have a ledge developed for about 300 feet, with average of three feet thickness. Last clean-up went \$45 per ton. Work eight or ten men (all white men). The whole outlook at present favorable. They use a hurdy wheel, water from Park canal and water company, under a pressure of 300 feet. New York capital interested.

### The Griffith Con. M. & M. Co.,

Located one mile south of Dead springs, has a shaft 140 feet in depth; east vein of ledge at the 80-foot level is eight feet thick, of finely laminated rock, showing rich in free gold. My next view of the ledge at 120-foot level, 12 feet in thickness, showing finely in free gold and sulphurets. A new prospect mill to run by water from the Park ditch is about ready to start up, or was to start a few days since. The mill is being built by contract by a very successful machinist, D. E. Wickham, of Placerville. The whole management of the property is with M. G. Griffith, at Diamond Springs. The specimens of sulphurets, as also those rich in free gold taken from the mine, speak very encouragingly for a real success—obtained not by accident, but by going carefully to work where Mr. Probabilities pointed, and there achieving success as reward for continued effort.

The time may be near at hand when hundreds of these enterprises will be started by men of small capital and prove that instead of the gold being exhausted, that the real deposit had not yet been reached by early miners. About three miles out of Diamond Springs an Oakland company have purchased some mining and farming lands, to carry on farming and mining. Messrs. Fredrick, Olmstead and Watt are the associated parties. They have 80 acres as mining land and 160 as farming, but expect some of the farming land will pay for mining. It will furnish them a healthy summer resort and good investment aside from the mines. There are many opportunities to buy valuable properties very cheaply through all this region. Why? does a voice ask? My hotel man has answered it in this way: "Many of these people have been here too long; they got here early, made money easy, and now will not reconcile to the changed condition, and dream yet that some windfall will make them rich without an effort."

### Mining in Amador Co.

[From Our Regular Correspondent.]

EDITORS PRESS:—Sutter Creek is a large and thriving town of perhaps near 1,500 inhabitants, four miles from Jackson, the county seat. In addition to all the ordinary trades, professions, and merchandising, there are two iron foundries and machine shops, with their lathes and planing machines, so that very large and complicated machinery is made and repaired here as well as in San Francisco. At Knight's foundry and machine shop I saw various sizes of his celebrated solid water wheel being fitted up. It is being used very extensively and does its own advertising for efficiency, durability and cheapness. The demand for it is increasing and extending.

Knight's foundry is turning out some very heavy quartz mill mortars (with Knight's improved false backs) all ready for shipment.

They also cast the heavy lead gas generators

for sulphurets works, a job requiring much skill, and only a few can succeed in casting them.

The sulphurets works of Sutter are under the management of Mr. C. J. Garland, and are running right along, not as an experiment, but as an acknowledged success, and now a necessity in every milling community, to force the sulphurets to give up their gold. The mines in and about Sutter Creek that are running are not running with full force of men.

### The Oneida Co.,

Under the management of Robert Robinson, a thorough and experienced mill and mine operator, is employing not more than half complement of men, and not using all their stamps. The Oneida has extensive improvements in hoisting and milling facilities; located very pleasantly, and well adapted to work with strictest economy.

The high reputation of its Superintendent for efficiency, strictest economy, and success, while superintending in Nevada is a good assurance that he will soon have the lively music of the eighty stamps. Would like to give some figures of present doings, but they are not at hand.

The Eureka mill, now the Amador Consolidated, is running 40 stamps, is said to be doing well. Mahoney mine is running a small force. The Lincoln is also running.

### The Amador Canal and Mining Co.,

Very extensively engaged in water, mines, milling and lumber, are starting to build a mill for lumber sawing, and manufacturing doors, etc., on the hill between Sutter Creek and Jackson and propose to send the lumber along the divide 12 miles down to Lone by a V flume.

They will float their bolts and short logs down the canal to the mill. They are furnishing water power for ten or twelve mills, and always utilizing the water again and again. It is astonishing to see the change that a little stream of water will produce on hill and valley. It seems to create almost from nothing, everything beautiful and useful and populate the waste places. The thin bed-rock soil is improved by the sediment of fine sand and loam deposited by the turbid water, and made productive.

The Phenix Gold and Silver Mining Co. At Plymouth, owned principally by Hayward in charge of Mr. Green, and Mr. Jones, foreman, is at present running an 80-stamp mill and 125 men. The mill uses water power, while the mine uses steam for hoisting.

Timbers are brought 25 miles by canal, four men bringing 100 logs through daily. The 20-inch water-wheel uses 600 inches under 65 feet fall. The mine is worked to depth of 1,000 feet. Bullion yield averaging very well. The saving of concentrated sulphurets about 2½ tons per day, which pays about \$125 per ton above cost of working. The sulphurets are worked to 85 per cent. of assay value. Charge \$25 per ton for desulphurizing.

### Tybo District

A correspondent of the Belmont Courier, writing from Tybo, says:

The Tybo mining property, well known and highly spoken of, is undoubtedly one of the most productive in this section of the great east. Three years ago it possessed neither name nor reputation to give it prominence in the mining circles of the coast. It was undertaken as a venture, but as a venture it has proved a magnificent success. Writing of its purchase to the San Francisco MINING AND SCIENTIFIC PRESS in March, 1874, I predicted this success, and now after three years of active development I find that my predictions have been more than borne out by the brilliant results that have been obtained. I quote: "The spunkiness of San Francisco capitalists, when viewed in connection with this property, is certainly singularly strange, to say the least. To have allowed it to remain there (I wrote from Eureka), lying idle during the past three or four years, without making hardly an effort to acquire it, does not speak very well for either their sagacity or enterprise." A few of those mining men, who at the period referred to contemplated its purchase, have since then regretted the procrastinating influences which were mainly instrumental in preventing it from coming under their control. Bill Lett, George Hearst and the irreproachable Gashewit, with all their wide-awake properties, allowed it to slip out of their hands. So much the better for the interest of Tybo that it did, for it is doubtful whether the property would, under the management of these old and experienced manipulators, have been either as highly developed or as profitably worked as it has been under the direction of its present owners. The series of mines (five in number), which

### Comprise the Property,

Are located on a true fissure, whose strike is south of east and north of west, with the angle of dip to the northeast. The Two G mine, whose name has made the property famous, is the best explored of the group; though the Hunkidori is now being very vigorously prospected, and with excellent results. The work is done by contract under the immediate direction of C. S. Hammer, the contractor. An incline shaft of some 250 or 300 feet has been sunk along the dip of the lode, and drifting in opposite directions along its trend, is disclosing a well-formed vein and good prospects. The Two G mine and its extension on the southeast, on the upper slopes of Precipio mountain, lately purchased of Messrs. Garrett & Jagslin, are now in a very prosperous condition, and every foot of virgin ground that is being opened

brings to light large masses of high grade ore. The lode, too, continues to maintain its reputation for both the strength and regularity of its formation. The perfection of its walls—limestone on the baring and porphyry on the foot—and for the general uniformity which from the first has distinguished its dip to the northeast. The main hoisting shaft has now reached a depth of between 300 and 400 feet, but the depth from the lowermost workings to the apex of the lode must approximate 700 feet. There is considerable water encountered in the shaft, but not enough to test the capacity of the new steam pump, which keeps it under effectual subjection. Everything in and around the mine and works moves with the regularity of clock work. There are from 90 to 100 tons of ore daily extracted and

### Hauled to the Furnaces

For reduction. These cupolas are under the immediate control of Mr. David Stringer, formerly of the Richmond Consolidated at Eureka, who, as a thoroughly practical and experienced smelter, assayer, bullion refiner and metallurgist, has few equals in this State. The Eureka ores carry an ample supply of fluxing matter, hence the readiness with which they are smelted. This, however, is or has not been the case with the Tybo ores, which, until lately, were singularly destitute of the ferruginous gangue so essential for fluxing purposes. This paucity of iron and other aids to smelting, has heretofore necessitated the use of a considerable quantity of lime, which, of course, materially reduced not only the reduction capacity of the furnaces, but the profits of the company, in consequence of the increased cost of working the ores. Happily for the interests of the owners this state of thing no longer exists, for the ores are now better leached than formerly, and the lode is likewise producing more iron than it did at any former period in its history. The

### Reduction Capacity

of the furnaces approximates on an average 92 to 95 tons each 24 hours, and their daily bullion output, which, of course, fluctuates here as everywhere, may be placed at from 9 to 11 tons for the same period. The latter was the result obtained from the 24-hour's run ending at 7 A. M. on the 2d instant. This is a good showing, and it speaks well for both the mine and the skill of the smelter. This bullion exhibits an average assay value of \$450 per ton; this would give \$4,950 as the result of the 24 hours' run, which I incidentally give for the purpose of illustrating the increasing value of the property as well as the success that invariably attends skillful management. Ever since David Stringer assumed control of the reduction department, the quantity of lime flux used has been daily decreased, thereby adding to the reducing power of the furnaces, and the monthly returns have also steadily increased, and but for the unavoidable stoppage of one furnace for six days last month's bullion yield would be found far in advance of all preceding ones. But notwithstanding the loss entailed by these six days, the June yield exhibits an aggregate of \$99,413.39 which I account a very handsome showing for about 21 day's run of one furnace and 29 day's run of the other. These works have produced 317 shipments of 10 tons to the shipment since active smelting operations were inaugurated less than three years ago. Taking the present value of bullion as a basis for calculation, and much of it has exceeded this rate, we find that those 3,170 tons have produced a total of \$1,426,500, or at the rate of \$600,000 or \$700,000 per annum, for smelting operations have not been carried on for much above two years and four or five months, and there was but one furnace used for the major portion of this time. The foregoing data will furnish the reader food for reflection, and by showing him how profitable a business is mining they will also give him a much better idea of the value of the Tybo property than he could receive from any other source. Were it located on the Comstock the price of its shares would be found away up among the fancy figures of the leading mines of that celebrated lode.

### Studying Mining.

The entire third class in the Department of Engineering and Mining of the Columbia College School of Mines, numbering about 30 students, left this city early yesterday morning by the Central railroad of New Jersey, for Drifton, Pa., for the purpose of obtaining some practical experience in the coal mines of that region. The entire party is under the charge of Professors Trowbridge and Monroe, and the intention is to have the young men go through all the regular duties of miners for some four hours each day. The objective point is in Luzerne county, on the edge of the great mining district of Pennsylvania, and it is possible that before their return the young gentlemen will also be inducted into the mysteries of extracting iron ore.

The students started out with the expectation of staying about a month in the coal region. They intend to work as ordinary miners while there, but not quite the full number of hours, as none of the professors having them in charge believe they would be able to endure the fatigue for more than half the regular time of ordinary miners. They intend, however, that the expedition shall be no mere holiday excursion, but that a valuable stock of knowledge shall be laid in by each student. Temporary quarters for the party will be provided by Mr. Eckley Cox, of this city, owner of one of the mines in the neighborhood, but all the necessary topographi-

cal and other instruments required for a scientific investigation have been taken by the party. Surveys of the district will be made, as also experiments at electrical blasting, under Prof. Monroe's direction.

When the students reach the mines, they will be told off in small parties and given in charge of a certain number of old miners, who are expected to give such information as they have at their command, and keep a general supervision over the young men under ground. They are expected to furnish a definite amount of coal per day, to be examined and "graded" like that of an ordinary miner, and paid for in the same way. In fact, the object in view by everybody is to give the students a little taste of what they have to expect if they want to earn their living in that way, or to let them know what those who do earn it so have to go through, in the hope that the experience will prove of benefit to them if they become superintendents or such like.

It has been the practice for a long time in Germany, where mining and engineering are more scientifically taught than here, to get up parties like this during each vacation, but the plan has never been tried here before. If this expedition should prove successful, as all hope it may, it will in all probability be the pioneer of a long line like it, not only from Columbia, but from the other colleges.—*New York World.*

### Silver King Products.

This mine has been shipping 30 tons per month of selected ore with great regularity for about a year. Nothing is shipped that goes less than \$1,000 per ton, and ores below that value are being stored away on the dumps. Actual receipts from sales of ores in San Francisco have averaged \$1,400 per ton, a few selected lots going as high as \$15,000 to \$20,000 per ton. The last lot of 10 tons sold for 82% of assay value. There is now en route one selected lot of over 1,000 pounds of a black malleable chloride ore from this mine, which is expected to sell at the rate of \$8 per pound; also 12 tons of ordinary \$1,400 ore. An incline has been sunk on the ledge, following the foot-wall for about 250 feet, and is in ore all the way down. The last reported assay from the bottom of this incline was \$825. Since the mine passed into the hands of Barney and Reagan, no stopping has been done, but ores taken from the openings, and below their standard shipping assay of \$1,000 per ton, have accumulated on the dumps to such an extent as to render it necessary to make more room by some disposition of them. As an experiment, a five-stamp mill, with power for more stamps, has been put up, and will be started up on Monday, the 25th. The whole dumps will be run through the mill, pulverized and then passed on to a Frue concentrator. The concentrations will then be sacked and shipped for sale in San Francisco. Experience has shown that the richer ores from this mine sell to smelting works in California for a higher figure than could be realized by milling them on the spot. The want of base metal for fluxes and scarcity of charcoal material in the immediate vicinity, make smelting works near the mine out of the question for the present. The last of the concentrating machinery is due on the ground to-day, and as all is in readiness for it, will be at work by the time the mill has pulp enough made to start. The supply on the dumps of ore assaying from \$300 to \$1,000 is very large. The lowest estimate of its net value for concentration is placed at \$500,000. Even if the contractors do more than is claimed for them, the tailings will be pretty fair milling ore. Last fall the Copeland brothers bought one of the smaller Silver King dumps for \$20,000 in cash. They spent nearly \$20,000 more in hauling it six miles down to water at Picket Post and concentrating it in rockers, jigs, sluice boxes and gold pans. The ore was not pulverized, but the larger pieces were simply broken and sorted by hand. The richer pieces and concentrations were shipped to San Francisco and sold. From less than 300 tons on the dump, they realized over \$100,000.—*Arizona Citizen.*

PETROLEUM DISCOVERIES.—It appears from the recent important discoveries of new oil-producing regions, that the supply in Pennsylvania is far from being exhausted. This new development is the most important that has taken place in years, and has already caused a considerable decline in prices. A Pittsburgh paper says: The most prominent features in the business interest of Pittsburgh this week are the remarkable development of new wells and the downward plunge of prices consequent thereon. The strikes at Bullion run have been of wonderful richness, and recall the strikes at Pithole in past years, when thousand barrel gushers were the ordinary prizes in this lottery of enterprise. A rough calculation shows that the strikes at Bullion run constitute an increase of production equal to 25% or 30% of the average of last month. In that view of the case it is not remarkable that the prices should give way from \$2.25, the quotation at the opening of the month, to \$2 at the first of the week, and then take a sudden plunge to \$1.50. It is not alone the increase of production thus developed, but the large addition of possible producing territory which sends prices down and makes it possible that prices this summer will seek the level they reached in 1873. As some of the banks have loaned quite freely on certificates as collateral at \$1.50, they will be obliged to call for more margins, which is likely to further assist the demoralization.



## MECHANICAL PROGRESS.

### Our Mechanical Triumphs.

The rapid advance which American mechanics and manufactures are making is the theme of frequent comment by the English press. The *Colliery Guardian*, after naming at least a score of instances in which America is trenching upon markets which have heretofore gained supplies from English sources, remarks as follows: These are a few illustrations of the increasing American competition with which our mechanical industry has to deal upon the great markets of the world. The Americans are not satisfied with having driven our iron and machinery out of their markets by means of a prohibitory tariff, but they are also endeavoring to reduce the demand for our steam engines, our locomotives, and our general machinery in the leading markets of the world. This was to be anticipated as an inevitable result of the great progress which American metallurgy and American coal-mining have made during the last seven years. Iron and steel of American manufacture have now become so cheap and are produced upon so large a scale that they must be worked up somehow; and if the articles into which they are converted cannot find a sale upon American markets, they must be disposed of upon the general markets of the world. This is the conclusion at which Jonathan has arrived, and it is only a natural consequence of the recent course taken by the industrial history of the United States. The circumstances to which we have been adverting appear to us to demand the gravest attention on the part of both the capitalists and the workmen of the Old World. We have always fancied that Belgian competition was a bugbear rather than otherwise. It is true that iron has been produced at marvelously cheap rates upon the Belgian markets, and that some of it has found its way into this country, and has displaced a corresponding amount of English iron. But the competition of Belgian mechanical and metallurgical industry with our own differs from the competition of American mechanical and metallurgical industry in this important particular—it is comparatively limited in extent, and consequently it does not do us the mischief which some writers have supposed. The case seems wholly different with the American competition with which we are now threatened. The productive powers of the Americans, to whatever branch of human effort they may devote themselves, appear to be only limited by the demand which may spring up for their products. Their supplies of ironstone are practically boundless; their supplies of coal are practically boundless; their supplies of labor are practically boundless. They greatly excel the Belgians in the extent and importance of the mercantile marine, by means of which they are enabled to scatter their manufactures all over the world. They also share with us apparently the facility of developing a world-wide commerce. Under the circumstances, we fancy that it is high time that both our capitalists and our workers should be sufficiently impressed with the fact, that in dealing with American competitors they have to confront competitors of first rate ability, energy and resources. The only means by which they can hope to grapple effectually with such competitors, is by standing well together, and acting upon the principle of thoroughly harmonious action. Without such harmonious action the industrial future of the country must be regarded as gravely compromised.

### A Problem for Inventors.

The American Philosophical Society, of Philadelphia, in the year 1866, offered a premium of \$500 for a process for the successful utilization of anthracite coal dust, to be competed for under the direction of the officers of the society. This prize, says the *Iron Age*, is still open for inventors. Attention is now called to the fact because Mr. J. E. Wooten gives notice to the society that he is ready to compete for the prize. This induces the society to prepare for the trial and to renew their invitation to all inventors to enter their processes. Mr. Robert Briggs, whom we believe to be an officer of the society, writes that Mr. Wooten's process is burning the material on a perforated grate, with closed ash pit and steam-jet blast, the coal slack being spread thin on the grate, the latter portion of the process being secured by a patent.

The following is the form for an application to the committee to take notice of an inventor's process:

To the American Philosophical Society: I have been informed that a premium has been offered by the society for the utilization of what is known as coal dust.

Without special reference to such a premium, I have had in operation in that direction a process, and the results are so satisfactory, and, I think, conclusive, that I desire to submit them to a committee of the society for examination and report thereon.

Should my process be deemed worthy of the premium offered, I shall feel highly honored. Respectfully,

Concerning the above, Mr. Briggs says: This offer has been a standing one until the present time, but an applicant for the award having presented himself, the society has now appointed a committee to consider the subject. Application

tions with evidence and description can be sent to the society at any time during the next three months, until which time the action of the committee will be deferred to allow every method proposed or in use to be properly represented in the competition. Considering the almost national importance of the utilization of the immense quantity of waste fuel now accumulated and accumulating in the form of dust at the mines, this step of one of the oldest American scientific societies possesses the highest interest, and the premium offered bids fair to bring to publication the various methods now proposed to accomplish the desired result. The accompanying form will serve to give an idea of what is necessary for an application.

### A Substitute for Brass.

A very beautiful new alloy, intended to replace brass in various ornamental uses, especially in window and door furniture, has been invented by Mr. W. A. Hopkins, of Paris. The alloy is composed of copper, tin, spelter or zinc and lead, which metals are manipulated. A crucible is placed in the furnace and fired to a red heat, and into the crucible thus heated the metals are placed in the proportions of—tin  $1\frac{1}{2}$  (say) 1 oz.; spelter or zinc,  $\frac{1}{2}$  oz.; lead, 5-16ths of an oz. These are the proportions he prefers to use, as he has found them to give excellent and satisfactory results, but he does not intend to confine himself rigidly to the precise proportions named, as they may, perhaps, be slightly varied in some particulars without materially detracting from the beautiful color of the alloy which it is intended to produce. The molten metals are kept well stirred, and any impurities therein should be removed. When thoroughly mixed this alloy, which is termed the first alloy, is poured off into ingot molds and left to cool. Copper in the proportion of eight parts to one of this first alloy is then placed in the crucible and brought to a melting heat, when the tin or first alloy is added and intimately mixed with the copper, for which purpose the molten mass must be well stirred for several minutes. It is then poured into ingot molds for sale in the form of ingots, or it may be poured into pattern molds, so as to produce the articles required. This is the mode of manipulation which it is preferred to employ, as an opportunity is thus afforded of removing any impurities from the first alloy before mixing it with the copper, but all the metals may, if preferred, be mixed together in the proportions given and melted at one operation. By this means an alloy is obtained of great strength and of a very beautiful appearance, and which is particularly suitable for small work, such, for instance, as window and door furniture and other house furniture, which is usually made in brass or other alloy of copper, though it is not intended to confine its use to such articles.

**LOSS FROM OXIDATION.**—In advocating the use of better machinery in iron making, Mr. Holley, in a recent address, said: "Do iron-makers realize the enormous loss due to oxidation? An iron-rail mill making 40,000 tons of product, heating all the material twice and oxidizing not less than 8% of it at each heat, would, at present prices, burn up more than \$200,000 worth of iron a year. Upon averaging a number of results, I find the saving in the oxidation of iron in regenerative gas-furnaces, as compared with coal-furnaces, to be over 3%. In one case of first-rate practice with both furnaces, on small iron billets, it is 3.32%; in another case of good average practice on large iron piles it is 4.45%. In heating iron piles for plates, the waste in the ordinary furnace has been in some cases as high as 15%, while in Siemens's furnaces, which have been substituted in the same works, it has been as low as 4%. The smaller of these savings would amount, in the rail practice we are considering, to some \$70,000 per year, which would pay for half the labor on rails, or it would pay above 20% on the cost of a rail-mill. The oxidation of steel is somewhat less in either furnace, because the required temperature is lower; but the proportion of loss appears to be about the same, so that the economy of the gas-furnace is also very important in heating steel.

**THE COST OF LUBRICATION.**—A few days ago a gentleman well known as a manufacturer of railroad material called at the office of the *Railroad Gazette* and propounded the question: "What does it cost to oil railroad cars?" We referred to Mr. Fink's reports of the Louisville and Nashville railroad, and found there that the cost of oil and labor of applying it is given in the report of 1875-76 both for passenger and freight cars, and also the total distances run by each, from which the cost per car mile is of course easily deducible. This cost is as follows: Cost of oil and waste per car per mile, passenger, 0.221 cents; freight, 0.094 cents. Cost of labor per car per mile, passenger, 0.066 cents; freight, 0.039. Total cost of lubrication per car per mile, passenger, 0.287 cents; freight, 0.133 cents.

**IRON IN FRANCE.**—The iron trade of France is improving. The business done in 1876 was: Pig, 1,422,500 tons; iron, 861,000; steel, 247,000 tons, or a total of 2,625,000 tons. As against 1875, the make of pig was greater by 33,309 tons; the finished iron less by 21,170 tons; that of plates greater by 205 tons, and steel, 4,004 tons.

## SCIENTIFIC PROGRESS.

### Questions for California Botanists.

Dr. Asa Gray writes to the *American Journal of Science and Arts* a brief communication to describe a peculiar structure which *Megarrhiza Californica* exhibits in germination, and to call for observations upon other species, at the time of germination, in the hope of thereby extending our present imperfect knowledge of this genus of high-rooted *Cucurbitaceae* of our Pacific coast. For the extraordinary peculiarity in question, being one which, in other cases, is known to exhibit itself in certain species of a genus (as in *Anemone* and *Delphinium*), and not in others, so it may in the present genus give aid in distinguishing the five species which have been characterized upon more or less incomplete or scanty materials.

After reviewing the points in the known history of the plant, as recorded by other observers, Dr. Gray writes as follows: The *M. Californica* had been raised in the botanic garden of Harvard University many years ago, but I had not seen the germination; and we were never able to bring the plant into blossom, as it invariably died down to the ground soon after making a moderate growth. On germinating some fresh seeds early this spring, I was somewhat surprised to find that they came up in the manner of beans. Instead of remaining hypogaeous, as from the great thickness of the cotyledons would have been expected, the body of the seed in its shell was raised well out of the soil upon what seemed to be a well developed radicle, like that of *Echinocystis*. If the cotyledons had expanded, though remaining fleshy, in the manner of *Phaseolus*, the difference between this and *Echinocystis*, with cotyledons truly foliaceous in germination, would be much less than had been supposed. I waited long to see if this would occur; I also waited in vain for the expected development of the plumule from between the bases of the fleshy cotyledons. After the lapse of about a fortnight, the plumule in all three of my germinating plantlets came separately out of the soil of the pot. That is, the plumule came forth from the base of what appeared to be an elongated radicle (of two or three inches in length); and below this the thickening of the root, which acquires enormous dimensions in old plants, had already commenced. A large amount of the nourishing matter stored in the cotyledons had been carried down to the root and used in its growth as well as that of the plumule. The latter came from a cleft at the very base of the seeming radicle, which otherwise appeared to be solid. But on cutting it across toward the base this was found to be tubular; and later, when more spent and beginning to wither, this stalk was separable from above downward into two parts.

This, therefore, is a case in which long petioles to the cotyledons (of which there is no appearance in the seed), connate into one body, are developed and greatly lengthened in place of the radicle, which is thus simulated. It is the same as in *Delphinium nudicaule* of California and some other species; only in that genus the cotyledons expand and become foliaceous.

Botanists on the Pacific coast are earnestly requested to examine the germination of all the species of *Megarrhiza*, and to compare with them the descriptions which are here given. At least three species should be met with near San Francisco, and in neighboring parts of California. According to the characters assigned by Mr. Watson in the "Botany of California," *M. Californica* should be known by its obovoid seeds, of less than an inch in length, with a small hilum at the narrow base; *M. Marsh*, by its numerous seeds horizontally imposed in a large fruit (of four inches in length), each seed roundish and depressed, flattened an inch in diameter and about half as thick, with a prominent lateral hilum. *M. muricata*, by a nearly naked fruit only an inch in diameter, containing only two globose seeds of half an inch in diameter. *M. Oregona*, which is known to occur from the Columbia river to the north of California, appears to have seeds resembling those of *M. Marsh*, but rather smaller; but they are not well known. The remaining one, *M. Guadalupeensis*, of Guadalupe island, off Lower California, is much out of ordinary reach, unless it should be found in the southern part of the State. Mature fruits and seeds of all the species are much desired.

**RUSSIANS AND TURKS.**—Scientific societies are turning their thoughts to war topics. At a recent meeting of the English Statistical Society, Mr. Ravenstein read an elaborate paper on "The Population of Russia and Turkey." The former of these empires has 84,584,482 inhabitants, the latter only 25,986,868, or, including Egypt, Tripoli, and Tunis, 43,408,900. The population of Roumania is 4,850,000; of Servia, 1,352,500. The population of Russia increases at the rate of 1.1% per annum, the increase amongst the Jews being at least double what it is amongst the Christians. With respect to Turkey, there exists no data for calculating the increase, though it is most probable that the dominant race does not increase at all, a fact accounted for by vicious practices prevailing amongst the women, and by the sacrifices demanded from it for the defense of the empire. Some curious facts were communicated with respect to the proportions between males and females. Throughout Asiatic Russia and in a considerable portion of European Russia the

male sex preponderates. The same fact has been noted in Roumania, in Greece, and in other parts of Europe. The author thus summed up the results of his investigations:—In the Russian empire there are 100 Russians to every 50 members of other nationalities, and 100 Christians to every 16 Mohammedans and Pagans. In Turkey, on the other hand, 100 Turks have opposed to them 197 members of other nations, and 100 Mohammedans to 47 Christians. The advantage, in both these respects, is therefore entirely on the side of Russia, and the position of Turkey must appear in a still less favorable light if we look at the details of the geographical distribution of the dominant race and religion, and bear in mind the interest existing amongst Slavs and Greeks on behalf of some of the races dwelling within the limits of that empire.

**COMETS IN THE SPECTROSCOPE.**—The spectra of the three comets of the year, says the *Independent*, have been examined by a number of observers. Those of the first and third present no special peculiarity. They show the same three bands which have been found in the spectra of nearly all the comets hitherto observed. These bands, it will be remembered, are sharply defined at the less refrangible edge, but shade out toward the blue end of the spectrum, and seem to coincide exactly with three bands which are seen whenever a hydro-carbon gas is burning with oxygen. The flame of a Bunsen burner or the blue part of a common coal oil lamp flame shows them beautifully. From this coincidence the presence of some form of hydro-carbon has been inferred in comets. Hitherto only a single comet—that of Brorsen, observed by Huggins, in 1868—has shown anything different; and, as that comet was very faint and was observed with apparatus inferior to what is now at command, it was generally considered probable that the reported difference might be a mistake. The second comet of this year and the brightest of the three shows, however, according to the concurrent testimony of nearly all the observers, the same spectrum as Brorsen's—i. e., three bright bands diffuse at both edges; the middle one nearly in the same position as the middle hand of the ordinary comet spectrum, but the other two both less refrangible than the extreme bands of the ordinary spectrum. The spectrum of the nucleus was nearly continuous, indicating considerable density.

**RELICS IN A NEW YORK CAVE.**—The *Oreonta* (N. Y.) *Herald* tells of a cave which some hunters found by accident near that place. After procuring lights, rope, etc., they again entered the tunnel, which, though damp and dripping at the entrance, soon grew dry and dusty, protected by the sheltering rock above, and was filled with pure air. At a distance of 50 feet it terminated in a cave about 20 feet square and nine feet high, with a very irregular roof of flinty rock; and here came the remarkable part of the discovery. In one corner lay a heap of seemingly small rocks, covered with dust, but which on examination proved to be nuggets of pure lead weighing in all about a ton. Beside it, half buried in dry earth, a partly decayed skeleton, the skull and larger bones almost perfect, and scattered about were several curious copper implements. There has long been a legend extant among the old settlers here of a lead mine in the neighborhood, and of the Indians bringing in lumps of lead but refusing to tell where they were obtained. Probably it was brought from the lake region, and this cave was made a store-house, and the skeleton was that of an Indian.

**MICROSEISMIC OBSERVATIONS.**—Father Bertelli, according to the *Journal of the Franklin Institute*, after discussing more than 20,000 observations, made from 1870 to 1875, reaches the following conclusion: The oscillations of isolated pendulums are generally parallel or perpendicular to the axes of valleys or mountain chains. The oscillations are not dependent upon local vibratory movements, nor on the velocity or direction of the wind, nor on rains, nor on thermometric or electric changes. The tectonic movements are most vertical at the time of earthquakes. The positions of the sun and moon seem to influence the movements of the pendulums, but they are especially frequent when the barometer is low.

**A NEW EXPEDITION.**—Prof. Nordenskjöld's great expedition, for which a vessel has already been chartered at the price of 150,000 crowns, is to leave Gothenburg in June, 1878. It is to circumnavigate the whole of Asia through the Polar sea, the Behring straits, along the east and the south coast of Asia, and to return to Europe through the Red sea and the Suez canal in the autumn of 1879. King Oscar has contributed 50,000 crowns towards the expedition. The principal expense of the expedition will be borne by Mr. Dickson, a merchant of Gothenburg.

**A SCHOOL FOR MILLERS.**—At a recent convention of the United States Millers' Association, Mr. Frank Chamberlain, of Albany, N. Y., offered the following resolution: "Resolved, That a committee of three be appointed by the President to take into consideration the subject of establishing, under the patronage and guidance of the Millers' National Association, a school or college for instructing and educating millers, and, if practicable, to report a plan therefor at the next annual meeting of this body." The resolution was adopted.



## Table of Highest and Lowest Sales in S. F. Stock Exchange.

Name of Company.	Week Ending July 13.	Week Ending July 14.	Week Ending July 15.	Week Ending July 16.	Week Ending July 17.	Week Ending July 18.	Week Ending July 19.
Alpha.....	131	111	12	111	12	91	121
Alta.....	2.05	1.11	1.11	1.11	1.11	1.11	1.11
Baltimore Con.....	700	500	14	500	500	500	1.600
Belcher.....	1.10	900	5	5	5	3.90	2.95
Belmont.....	74	6	21	201	191	181	141
Best & Belcher.....	4.05	3.20	34	34	34	4.10	2.90
California.....	341	321	34	331	34	32	261
Challenge.....	35	301	311	30	331	32	25
Confidence.....	74	51	1	8	5	4	1
Con Imperial.....	1.40	1.05	1.20	1.05	1.10	1.10	750
Con Virginia.....	341	321	34	331	34	32	261
Crown Point.....	5	4	4.15	3	3	3.80	2.40
Dayton.....	750	500	500	400	300	150	150
Eureka Con.....	191	19	181	241	191	251	251
Exchequer.....	61	61	61	61	61	61	61
Gold & Silver.....	150	50	50	50	50	50	50
Grand Prize.....	13	101	121	141	121	141	13
Gila.....	400	250	250	750	250	1	800
Golden Chariot.....	11	11	11	11	11	11	11
Gould & Curry.....	161	13	131	131	131	131	131
Hale & Norcross.....	61	5	5	5	5	5	5
Hudson.....	34	2.60	2.20	2.20	2.20	2.20	2.20
Justice.....	88	71	71	51	81	51	71
Kentuck.....	51	4	4	4	4	4	4
K K Con.....	51	4	4	4	4	4	4
Knickerbocker.....	11	250	300	250	250	250	250
Lady Bryan.....	650	600	650	600	600	600	600
Lady Wash.....	1.60	1.1	1.1	1.20	1.1	1.1	1.1
Leopard.....	800	400	450	400	400	400	400
Leviathan.....	1.65	1.31	1.45	1.45	1.31	1.31	1.31
Leeds.....	2.45	1.95	2.05	2.05	2.05	2.05	2.05
Modoc.....	81	71	71	81	81	81	81
Manfield.....	500	150	100	800	750	650	500
Meadow Valley.....	121	101	101	111	91	111	91
Mexican.....	121	101	101	111	91	111	91
North Con Virginia.....	500	350	300	250	300	200	350
New York.....	161	151	161	161	171	161	171
Northern Belle.....	131	1	1.40	1.21	1.21	1.10	1
New Coso.....	20	15	17	17	17	17	17
Ophir.....	161	131	141	131	141	141	141
Overman.....	11	11	11	11	11	11	11
Pacific.....	600	550	500	450	400	350	300
Phil Sheridan.....	500	250	300	250	250	250	250
Pioneer.....	8	8	8	8	8	8	8
Prospect.....	500	250	300	250	250	250	250
Raymond & Ely.....	500	250	300	250	250	250	250
Rock Island.....	8	8	8	8	8	8	8
Sage.....	250	200	250	200	200	200	200
Seg Belcher.....	2.50	2.00	2.10	2.10	2.10	2.10	2.10
Sierra Nevada.....	6.40	5.60	5.60	5.60	5.60	5.60	5.60
Silver Hill.....	2.90	1.50	2.10	1.80	1.60	1.50	1.40
Southern Belle.....	500	250	300	250	250	250	250
Suocor.....	1.15	850	900	750	800	600	450
Trojan.....	61	51	51	51	51	51	51
Union Con.....	61	51	51	51	51	51	51
Wells.....	450	300	310	310	310	310	310
Woodville.....	131	111	111	101	81	101	71
Yellow Jacket.....	131	111	111	101	81	101	71

## Sales at S. F. Stock Exchange.

FRIDAY, A. M. JULY 13.	50	Dardanelles.....	950
110 Alpha.....	121	200 Dayton.....	200
520 Alta.....	1.00	100 DeFrees.....	500
745 Andes.....	950	100 Exchequer.....	61
150 Argenta.....	1.00	270 Eureka Con.....	270
700 Best & Belcher.....	1.10	100 Empire Id.....	2.40
95 Belcher.....	1.10	50 General Thomas.....	200
410 Bullion.....	61	455 Gold & Curry.....	1.10
1715 Con Imperial.....	3.80	100 Grand Prize.....	1.10
300 Crown Point.....	3.80	155 Gila.....	1.10
190 California.....	3.80	270 Golden Chariot.....	500
515 Con Virginia.....	3.40	270 Hale & Nor.....	500
100 Chollar.....	3.20	355 Julia.....	1.60
710 Caledonia.....	3.20	355 Kossuth.....	250
40 Dayton.....	250	200 Leeds.....	250
1470 Exchequer.....	1.00	200 Leopard.....	1.30
790 Gould & Curry.....	1.20	100 Lady Wash.....	1.10
70 Hale & Nor.....	2.10	450 Leviathan.....	400
375 Julia.....	2.10	450 Lady Bryan.....	650
85 Kentuck.....	4	100 Morning Star.....	25
60 Lady Bryan.....	650	60 Manhattan.....	50
100 Lady Wash.....	1.10	100 New York.....	1.05
580 Leviathan.....	400	135 Mexican.....	100
500 Modoc.....	1.10	100 New Coso.....	1.05
900 New York.....	250	175 North Con Vir.....	300
100 North Con Vir.....	300	50 Northern Belle.....	1.10
150 Overman.....	1.10	355 New York.....	150
500 Phil Sheridan.....	1.10	315 Overman.....	130
200 Prospect.....	100	300 Ophir.....	150
1270 Peytona.....	1.10	300 Phil Sheridan.....	1.40
440 Savings.....	200	200 Prospect.....	100
1450 Sierra Nevada.....	5.60	1075 Peytona.....	1.10
200 Silver Hill.....	1.10	290 Raymond & Ely.....	800
300 Solid Silver.....	1.10	300 Rye Patch.....	3.40
620 Trojan.....	700	40 Rock Island.....	40
125 Union Con.....	5.20	250 Solid Silver.....	2.65
355 Yellow Jacket.....	1.10	210 Savings.....	2.65
AFTERNOON SESSION.		570 Silver Hill.....	1.10
300 Argenta.....	1.60	650 Sierra Nevada.....	5.60
100 Alps.....	300	100 Solid Silver.....	1.10
505 Alta.....	1.00	100 Seg Belcher.....	21
230 Andes.....	900	1070 Trojan.....	550
300 Belcher.....	3.70	185 Union Con.....	50
100 Belmont.....	1.10	100 Utah.....	12
185 Best & Belcher.....	1.10	130 Yellow Jacket.....	1.10
230 Bullion.....	61	MONDAY, A. M. JULY 16.	
300 Caledonia.....	3.30	100 Alta.....	1.90
70 Chollar.....	3.20	450 Andes.....	800
365 Con Virginia.....	3.40	620 Bullion.....	5.60
300 California.....	3.30	40 Belcher.....	3.65
570 Con Imperial.....	1.10	1335 Best & Belcher.....	1.60
200 Coso Con.....	1.10	270 California.....	300
440 Exchequer.....	61	270 Crown Point.....	3.80
1300 DeFrees.....	750	940 Crown Point.....	3.15
150 Empire Id.....	2.40	1500 Con Virginia.....	300
225 Eureka Con.....	260	20 Chollar.....	270
450 Exchequer.....	61	450 Con Imperial.....	1.10
620 Grand Prize.....	1.10	350 Caledonia.....	1.10
1250 Golden Chariot.....	500	225 Dayton.....	200
2750 Gould & Curry.....	1.20	1330 Exchequer.....	600
1750 Gila.....	5.60	3090 Gould & Curry.....	1.10
450 H & Norcross.....	700	1015 Hale & Nor.....	500
490 Julia.....	2.20	360 Justice.....	70
450 Justice.....	700	250 Julia.....	1.60
200 Lady Bryan.....	500	100 Joe Scates.....	500
585 Leopard.....	1.10	100 Kentuck.....	4
2745 Modoc.....	1.10	100 Lady Bryan.....	650
50 Mexican.....	1.10	300 Mexican.....	100
125 Northern Belle.....	1.60	400 New York.....	300
200 Overman.....	1.10	650 New York.....	300
180 Crown Point.....	3.40	650 Bullion.....	5.60
1410 Con Imperial.....	1.10	650 Bullion.....	5.60
640 Caledonia.....	3.30	220 Caledonia.....	3.40
275 California.....	3.30	200 Coso Con.....	1.10
40 Chollar.....	3.20	200 Con Virginia.....	300

70 Chollar.....	1.10	27	320 Morning Star.....	21
650 Crown Point.....	3.80	27	250 New York.....	250
940 Con Imperial.....	1.10	27	25 North Con Vir.....	250
550 DeFrees.....	750	27	315 Ophir.....	1.60
310 Eureka Con.....	2.40	27	535 Overman.....	1.20
1175 Exchequer.....	61	27	1150 Peytona.....	1.40
630 Gila.....	900	27	500 Rock Island.....	40
625 Grand Prize.....	1.10	27	425 Savage.....	5.60
40 Golden Chariot.....	500	27	45 Seg Belcher.....	21
165 Gould & Curry.....	1.10	27	400 Sierra Nevada.....	4.80
170 Con Thomas.....	200	27	90 Silver Hill.....	1.10
100 Hale & Nor.....	4.40	27	600 Trojan.....	500
100 Huesey.....	200	27	100 Union Con.....	4.80
235 Justine.....	700	27	50 New Coso.....	1.10
585 Julia.....	1.60	27	450 Yellow Jacket.....	1.10
100 Leopard.....	1.30	27	AFTERNOON SESSION.	
120 Leeds.....	800	27	750 Alps.....	350
85 Manhattan.....	510	27	105 Argenta.....	1.60
50 Meadow Valley.....	650	27	355 Best & Belcher.....	1.60
540 Modoc.....	1.10	27	35 Belcher.....	34
250 Mexican.....	1.10	27	200 Belmont.....	1.10
170 Northern Belle.....	1.60	27	1200 Con Imperial.....	1.10
40 New Coso.....	1.10	27	355 California.....	3.15
355 Overman.....	1.10	27	355 California.....	3.15
425 Ophir.....	1.10	27	355 California.....	3.15
300 Peytona.....	1.10	27	355 California.....	3.15
175 Rye Patch.....	3.40	27	355 California.....	3.15
75 Raymond & Ely.....	800	27	355 California.....	3.15
20 Rye Patch.....	3.40	27	355 California.....	3.15
355 Savage.....	5.60	27	355 California.....	3.15
420 Utah.....	1.10	27	355 California.....	3.15
515 Yellow Jacket.....	1.10	27	355 California.....	3.15
TUESDAY, A. M. JULY 17.		27	355 California.....	3.15
370 Alta.....	1.10	27	355 California.....	3.15
455 Alpha.....	1.10	27	355 California.....	3.15
170 Best & Belcher.....	1.10	27	355 California.....	3.15
540 Bullion.....	3.40	27	355 California.....	3.15
500 Bullion.....	3.40	27	355 California.....	3.15
1000 Caledonia.....	3.15	27	355 California.....	3.15
255 Crown Point.....	3.15	27	355 California.....	3.15
1230 Con Imperial.....	3.15	27	355 California.....	3.15
850 Con Virginia.....	3.15	27	355 California.....	3.15
400 Caledonia.....	3.15	27	355 California.....	3.15
50 Challenge.....	1.10	27	355 California.....	3.15
80 Chollar.....	2.70	27	355 California.....	3.15
100 Dayton.....	1.10	27	355 California.....	3.15
3250 Gould & Curry.....	1.10	27	355 California.....	3.15
235 Hale & Nor.....	4.40	27	355 California.....	3.15
315 Julia.....	1.60	27	355 California.....	3.15
115 Justice.....	700	27	355 California.....	3.15
100 Leviathan.....	400	27	355 California.....	3.15
355 Mexican.....	1.10	27	355 California.....	3.15

## SALES OF LAST WEEK AND THIS COMPARED

THURSDAY, A. M. JULY 12.	120	Alpha.....	1.10
175 Andes.....	1.10	350 Andes.....	1.10
245 Alta.....	1.10	350 Andes.....	1.10
455 Best & Belcher.....	1.10	350 Andes.....	1.10
125 Belcher.....	3.80	350 Andes.....	1.10
350 Bullion.....	61	350 Andes.....	1.10
240 California.....	3.30	350 Andes.....	1.10
1235 Caledonia.....	3.30	350 Andes.....	1.10
95 Chollar.....	3.20	350 Andes.....	1.10
400 Crown Point.....	3.80	350 Andes.....	1.10
675 Con Imperial.....	1.10	350 Andes.....	1.10
365 Con Virginia.....	3.40	350 Andes.....	1.10
200 Dardanelles.....	1.10	350 Andes.....	1.10
1240 Exchequer.....	61	350 Andes.....	1.10
300 Hale & Nor.....	4.40	350 Andes.....	1.10
430 Hale & Nor.....	4.40	350 Andes.....	1.10
690 Justice.....	700	350 Andes.....	1.10
355 Julia.....	1.60	350 Andes.....	1.10
200 Knickerbocker.....	500	350 Andes.....	1.10
400 Leviathan.....	400	350 Andes.....	1.10
200 Lady Bryan.....	650	350 Andes.....	1.10
285 Mexican.....	1.10	350 Andes.....	1.10
100 Morning Star.....	25	350 Andes.....	1.10
135 New York.....	1.05	350 Andes.....	1.10
210 Overman.....	1.10	350 Andes.....	1.10
245 Ophir.....	1.10	350 Andes.....	1.10
515 Prospect.....	1.10	350 Andes.....	1.10
175 Prospector.....	1.10	350 Andes.....	1.10
300 Rock Island.....	40	350 Andes.....	1.10
530 Savage.....	5.60	350 Andes.....	1.10
550 Sierra Nevada.....	4.80	350 Andes.....	1.10
160 Silver Hill.....	1.10	350 Andes.....	1.10
300 Trojan.....	500	350 Andes.....	1.10
225 Utah.....	1.10	350 Andes.....	1.10
100 Union Con.....	4.80	350 Andes.....	1.10
540 Ward.....	1.10	350 Andes.....	1.10
400 Yellow Jacket.....	1.10	350 Andes.....	1.10

AFTERNOON SESSION.		90 Alps.....	700
100 Alpha.....	1.10	100 Alps.....	700
375 Argenta.....	1.60	100 Alps.....	700
1335 Argenta.....	1.60	100 Alps.....	700
380 Best & Belcher.....	1.60	100 Alps.....	700
50 Belmont.....	1.10	100 Alps.....	700
140 Bullion.....	61	100 Alps.....	700
600 Caledonia.....	3.15	100 Alps.....	700



# MINING SUMMARY.

The following is mostly condensed from journals published in the interior, in proximity to the mines mentioned.

## California.

### AMADOR.

**HALL CLAIM AT WEST POINT.**—Ledger, July 14: The other day we were shown several specimens of quartz taken from the Hall mine at West Point, in Calaveras county. The ore ranks among the richest we have ever seen. Each piece of rock shown us must have contained from \$10 to \$20 in free gold. The vein from which these rich specimens were taken is 23 inches wide, and the lead is as pregnant with gold as the piece we saw. An effort will be made to take out a solid chunk 2x30 feet, for the purpose of sending it below for exhibition. F. C. Hall, of Jone City, is the sole owner of the property.

**ORAVEL MINING.**—Messrs. Payne and Young, representing San Francisco capitalists, have been around Jackson the past week, with the idea of negotiating for a number of gravel mines, and working them on an extensive scale. The conditions are that the buyer embrace the California claim, at French hill; also the claims of Truab & Bellard, and the Austrians in the neighborhood; also W. Moon's mine and a claim belonging to F. M. Brown, at Stony Creek. The parties contemplating the enterprise are making arrangements to secure the surplus water of the Amador canal, which will amount to nearly 2,000 inches, the company to receive a percentage of the proceeds in payment for water.

**HINCHLEY.**—The lessees, Messrs. Killo & Stribley, started work on their mine last week.

**BONANZA.**—S. S. Manon tells us that the Bonanza is looking exceedingly well. Sinking operations are through with for the present. The mill was started on the rock early this week, and will probably run steadily through the summer if the water holds out.

### CALAVERAS.

**WIN MINN.**—Calaveras Chronicle, July 14: There is no feinting of the remarkable yield of the Gwin mine. The ledge continues as rich as ever, and the output of ore is sufficient to keep the batteries constantly supplied. The rock is exceptionally rich, the yield bordering on the enormous. An average of \$11,000 per week is being cleaned up, which, for 24 stamps, is marvelous. The vein is by far the richest mine in the State. Upwards of \$50,000 has already been taken from the 1300-ft level, and it isn't fairly open yet. The level will unquestionably bring a million. Sinking for the 1400-ft level has been commenced. Additional batteries are to be set at work, and when the stamps are all employed it would be a low estimate to set the yield of the mine at \$30,000 per week.

**TIGER.**—Work has been temporarily suspended on the Tiger mine, at Rich gulch, for the purpose of making extensive improvements. The mine is to be incorporated, and we learn that a strong combination of San Francisco capitalists is prepared to take hold of the property. During the latter part of the coming September a 40-stamp mill is to be erected and the mine furnished with everything that can facilitate its advantageous working. There is no question but that the mine is a good one, although with the limited appliances at present available, it is not largely remunerative. The ledge is an immense one, covered from 10 to 15 feet in width, and it has been uncovered several hundred feet.

**AUSTRIAN.**—We continue to hear the most favorable reports from the Austrian mine, at West Point, the property of the Enterprise Co. M. C. The sinking of the new shaft is being prosecuted vigorously, a depth of 115 feet having already been reached. The ledge is showing magnificently. There is not an ounce of ore in it, so far as uncovered, but what will yield an average of \$20 per ton.

**UPPER COUNTRY ITEMS.**—Smith & Gouldson lately had 13 tons of ore crushed in Henry's mill, near West Point, that paid \$50 to the ton. Arthur & Porteus milled nine tons that paid an average of \$30. Hall's new mill on the Zacatoro—10 stamps—will be ready to start next week. Rich rock has been struck in the mine.

### EL DORADO.

**CENTENNIAL HITES.**—Amador Ledger, July 14: A few weeks back we mentioned that a large quantity of cube sulphur, bearing gold, taken from the Centennial Hites mine, was hauled to the Bonanza mill, at Drytown, for crushing. Forty tons were put through last week, and the result is a matter of astonishment to all, the yield being at the rate of \$20 per ton. It must be remembered that this result is obtained after the ore has undergone a thorough sluicing at the mine, and all the free gold captured.

### INYO.

**EMIGRANT COMPANY.**—Como Mining News, July 14: Peter Taylor, Superintendent of the Emigrant company's mine, came in from Lee last Tuesday, having got their five stamp mill in the finest working order. A greater supply of water has been obtained, and it is thought that the mill will run at a profit. A wonderful development is being made on both the Actus and Valentine mines, particularly in the former, where, at a depth of 45 feet, a 6-ft vein of \$400 ore has been struck in one shaft, while in another, some 30 feet deep, a 4-ft vein of the same kind of ore is encountered.

**MINNETTA BELL CO. COMPANY.**—W. E. Brown, Superintendent, brought in from R. C. Jacob's mill, last Tuesday, 10 tons of bullion, valued at something over \$6,000, which was shipped below the same day.

**NEW COSO.**—Two of their furnaces are now running, but we understand they will shut down in a few days for general repairs. The work on the mines is now done by contract, and consists of sinking to a greater depth and cross-cutting, so as to stop the ore from above. This accomplished, the furnace will again start.

**MONROE.**—A. Strong, Superintendent, says that everything is looking well in the mines; the two furnaces are running, but coal and water are a little short of the required demand.

**DEFIANCE.**—We made a trip up to the old Defiance last Tuesday, being the only one for a long time, for the reason that all labor had been concentrated at one point, for the purpose of running a drift from the main hoisting and Valine back to the second and third levels. A long time was consumed in making the connection with the second ledge, the rock being so hard that only from eight to ten inches per day could be made. The second ledge was reached, where some ore was encountered, but in limited quantities, it being in streaks and small pockets. The ledge itself is one of the strongest we have ever seen at a depth of 300 feet. The walls are perpendicular, and are carrying the scaly clay seam and being quite damp. It is evident that they unfortunately ran into a barren spot where the connection was made, but there is not a doubt but that further exploration, both by drifting and sinking, will develop an immense body of ore. We are confident of this, for the reason that the level directly above the ore was reached in large quantities.

We now proceed to the Hidalgo mine, owned by the Santa Rita M. & S. Co., situated a few hundred yards north from the Defiance. Wednesday last 10 tons of the very best carbonate and galena ore was taken out. They are down a little over 100 feet, and are drifting south from the shaft. There are two fine walls, carrying the scaly clay seam, and found in the Defiance. At a depth of about 75 feet it was at one time thought that the ledge was about to "pet out," but at the present depth it has widened out to nearly four feet and rapidly increasing. We notice that the ore vein in the Hidalgo is pitching directly toward the Defiance, and we hear the same thing of the Cuervo, and as these two mines are situated to the north of the Defiance, and are more elevated, we naturally conclude that the Defiance must go down deeper.

**CHATTANOOGA.**—This splendid property, owned by Say-

lor, Wallace & Riddle, situated some five miles from Darwin, is proving itself worthy the attention of those who desire to invest in big things. It has been developed to a considerable extent, and so far, from the richness of its ore, which have been shipped, and the money received therefor, has been able to pay for all expenses from the start. The ore which has been shipped has averaged a little over \$1,000 per ton, while several tons, averaging \$400 per ton, have been sold here.

**NOR REDDEN.**—Inyo Independent, July 14: The Silver Sprout mine and mill property, not having been redeemed from the Harris & Rhine judgment within legally prescribed time, has passed into the absolute ownership of that firm. It is understood, however, that the flex Month men have purchased the mill.

**CERRO GORDO.**—The Union Co. company took occasion on the Fourth to shut down the Beaudry furnace and overhaul the boiler and water jacket, which will be the work of but a few days. Ore is being extracted from the lowest level, and a raise is being made to connect the new level with the old one, after which a much stronger force will be put into the mine and probably the other furnace started up.

### NEVADA.

**MASSACHUSETTS HILL MINES.**—Grass Valley Union, July 12: The Gold Hill mine, the oldest in the district, is now being dug again, after years of idleness. This ought to cause Massachusetts hill to be put in working condition. We understand that parties interested in the Massachusetts hill properties have lately held a meeting, and that a disposition to resume work there was strongly manifested. Starting up the Massachusetts hill mines would be of incalculable advantage to the business and prosperity of this town, and will result in great gain to the owners of those mines.

**MINING ENTERPRISE.**—The Massachusetts Cong. Yuba River M. Co. own a set of claims six miles long, on the Yuba river, commencing at the mouth of Deer creek and extending up the river. Some of this ground was worked in former years and proved extremely rich. Much of it, however, has not been worked down to bedrock, where the most of the gold is found. The company named will work by sinking an incline on the side of the river bed, and then drift under the channel. Practical and experienced men assert that to be the true way to work the river bed.

**NEW ENGLAND.**—Nevada Transcript, July 14: Work is progressing splendidly at the New England mine. The new hoisting works will be in operation in a few days. The new incline is down about 100 feet, and has reached and passed the present level; it is now being continued on down toward the next level, through a body of exceedingly rich ore of an average thickness of two feet. The California mill is now crushing ore from this mine at the rate of 20 tons per day.

**THE LEE.**—Nevada Gazette, July 14: The tunnel being run by the Deadwood company to tap the ledge being longed to them situated at Willow hill, near Kitter's mill, is now in over 620 feet, and progress is being made at the rate of 10 feet a week. The last 50 feet has been in rock as hard as it is possible for rock to be. The tunnel is substantially timbered about 600 feet. The work has all been done inside three months. It is expected to strike the ledge in less than a month, and the company has a good prospect ahead of them. The ledge of the surface has been very rich and will doubtless be at the point tapped by the tunnel. Another ledge three feet in width was struck while running the tunnel, the rock from which looks well.

**TIGER.**There has been considerable prospecting going on up at Big Canyon creek, Washington township, this spring and the results have been very satisfactory. The extension of the Yuba lead has been thoroughly prospected and the rock, with the exception of a few feet, is all good. S. B. and PERCIVAL DAYTON are running on a ledge located near Deer creek, above the County House, which is said to be of good size and which prospects first-rate. Rock was taken from the same ledge years ago, and when crushed yielded handsomely.

**AT THE BLUE TENT.**Hydraulic gravel mine there will be 900 tons of powder exploded in one of the high banks of the lower river. The Superintendent, Mr. Hughes, informs us that water is plenty and that work will be continued for some weeks yet.

**THE ROMAN QUARTZ LEDGE.**which runs beneath the National hotel, has been purchased recently by the Nevada County Co-operative mining company and the work of development will be pushed ahead as fast as circumstances will permit. There is a tunnel in now between 300 and 400 feet on the ledge and it will be pushed ahead all farther. Rock from this vein when discovered in 1850 was said at the rate of \$250 per ton.

### PLACER.

**YANKEE JUNE.**—Cor. Placer Argus, July 14: Although the dry season has left us nearly all on the bedrock, we still have good reason to hope for better times soon, because the whole Divide is now attracting the attention of capitalists, and there is no better field for such men to operate. I am glad the Divide is now receiving the attention it deserves. Our drift miners are doing well, and the luck is coming their way. There is quite an excellent here now in regard to quartz, and every miner and boy in town has an "extension" on a ledge discovered one mile below here by T. G. Durning, about six weeks since, which is large and well-defined, and prospects well in free gold. The rock is a bluish-gray. Two companies are working on it. One of them, the Mastodon, is composed of T. G. Durning, John S. Mendonza and M. B. Tully. They have sunk a shaft 20 feet deep, and have started a tunnel that will strike the ledge about 150 feet deep. The Live Oak company, the first north extension, is owned by the Gilbert brothers, who are running a tunnel. They will strike the ledge at a depth of about 60 feet. Now is the time for quartz men to invest. We need a mill, and hope to have one, as one of our extensionists has located a mill site.

### PLUMAS.

**THE BLUE ORAVEL COUNTRY.**—Plumas National, July 14: We made a trip on Wednesday to the mines about Nelson point. The Franklin company are sinking slowly, but they have reached the ledge at a depth of 125 feet, and is now down about 125 feet; the lava is of a darker color than that above, and large boulders becoming plenty. Any quantity of small, washed gravel comes up in each tub, and the indications are strong that a few feet more will let them into the lead. Mr. Lacy is at the mine, and seems to think the chances A No. 1. At the Blue Gravel mine we found the work progressing splendidly. The boys are taking out some gravel, which, like all the balance in the claim, prospects well. They have commenced washing, but as yet have made no clean-up. The bedrock is pitching into the mountain—a good indication.

**KEYSTONE.**—We are told that the new mill at this place, near Argentine, has been running for the past three weeks, and the owners, Messrs. Walsh & Dawson, are well satisfied with the result. The ledge looks well as far as developed, and there is no reason to doubt the success of the enterprise. There should be more prospecting done in that section. All of the gulches paid well in quartz gold, and there are certainly some grand old ledges that "feed" them. Massac gulch turned out some of the finest specimen of rough, ragged quartz gold ever seen in the county, and no ledge has yet been developed at or near the head of it.

**THE BELL MINE.**—We took a look at the new quartz mill the other day, and found the work progressing favorably. The work is under the direction of Mr. Pelton. First J. H. Varied, of Camptonville, is also doing some first-class work on the new mill. The boiler is in place, and the work is being pushed up the river. The mine is being put in as fast as possible. Ten stamps will be started and more will be put in when the mine is opened properly. The workmen were taking out some fine looking rock, and we were told that it prospects well. The ledge in the face of the drift looks well, and everything indicates that the first run will prove that the mine is a success. The mill will be started up the next day, and there is a great deal of good quartz in that neighborhood, and the success of this mill will have the effect of starting up several more.

### SIERRA.

**SUPERANDED.**—The Ploocene company has suspended work for a few days, on account of being obliged to put tubing in their shaft, having struck sand. This will necessitate enlarging the bore a trifle. Sinking will be commenced again in about a week.

**RICU AS EVER.**—The North Fork mine continues as rich as ever. Some fine specimens were taken out a few days since.

**GILSONVILLE.**—The mining interests here are prospering, with a bright outlook ahead. The Union Chaledon, and Keifer & Emerson, and Gravel Hill company's claims are still yielding rich returns. Hydraulic mining is closed for the season. Near 100 men are being employed hereabouts, scarcity of water for mining purposes causing a large reduction in the working force of the claims. Most of the gold in this section is rather coarse.

### TRINITY.

**DEADWOOD QUARTZ.**—Trinity Journal, July 14: From developments made to date there seems to be no question as to the richness and great extent of gold quartz on Deadwood, and new and rich discoveries are still being made. George Klein, the original discoverer of the district, first went there from French Gulch, Shasta county, in 1872, erected an astrak in 1873, and has worked there ever since. Klein was in town this week and says that in his last work he crushed 12 tons of rock in 20 days with his astrak, and took out 56 ounces of gold. The quartz is rich at hand, but little work being necessary to get it out, as witness the fact that during 20 days Klein was running the astrak, a single man took out 70 tons of quartz.

### TULARE.

**MINERAL KING.**—Cor. Visalia Delta, July 14: It is now quite probable that the New England smelting company will not attempt to smelt the ore now being roasted until some ore richer in lead is found to use with it. Their Black Wolf tunnel is being pushed ahead as fast as the hardness of the rock will permit. A night shift was put on Sunday night. Two machine drills are expected here in a few days, and will be completed between the mill and the tunnel, and everything is being got in readiness to continue the work in a vigorous manner. A good tunnel has been made to the Empire tunnel, where prospecting is also going on.

## Nevada.

### BRISTOL DISTRICT.

**INUNCTION SUIT.**—Pioche Record, July 14: J. B. Vailancourt has brought suit against Garrison and Ewing, in the District Court of Lincoln county, for a one-third interest in the now discovery claim in Bristol district. The injunction will prevent the mine from being worked until bonds are given or the case decided.

### BULLION DISTRICT.

**THE LEE.**—Eureka Sentinel, July 13: Operations at the Lee mine have been suspended for some time. Mr. Gunnison, the original owner, expended \$80,000 in developing the property and erecting a mill, but notwithstanding that the ore was rich in lead, and the refractory nature baffled all attempts to work it profitably. Mr. Gunnison, after honorably settling all claims against the mine in full, sold the property to a couple of San Francisco capitalists, who, we understand, will renew work in a short time.

### CENTRAL DISTRICT.

**STRIKE.**—Silver State, July 13: From this district comes a report of a rich strike in the Silver Monarch, recently purchased by S. E. Holcomb. A ledge four feet wide, and carrying exceeding rich ore, is said to have been cut a few days ago in the tunnel on this mine.

### CORNUCOPIA DISTRICT.

**NEW CLAIMS.**—Cor. Silver State, July 16: The new finds just north of town are opening out splendidly. In the Athena they are down about 30 feet, with a well defined ledge 5 feet in width, 20 inches of which produces fine ruby silver ore, and assays way up. A lot of unassayed ore are assayed at the Leopard assay office went over \$300 per ton. The boys that own this claim are pushing the work ahead with vigor, and think they have as good a property as the Leopard ever was. The latter company are working more men now than they have at any time this season. There is also a large amount of wood being delivered at the mill, which shows that they mean to continue operations. The other mines are being worked in about the usual way, the Hussey producing a large quantity of good ore.

### ELY DISTRICT.

**RAYMOND & ELY.**—Pioche Record, July 14: There is no change; a little more than the usual quantity of ore is being extracted. The mill finished crushing the ore from the upper levels, and had started to crush the ore from the 1200-ft level, when the ore, which broke, so that nothing could be done in the way of crushing. Hardly enough of the new strike was crushed to take a battery sample, so that under the circumstances Captain Day ordered the mill to run on tailings for the balance of the month, and will start on the 1st of the month on the new ore.

**ALPS.**—The mines are now being placed in good shape, and the work of extracting the ore is satisfactorily progressing. The American Flag mill was started up on Monday last, the 15 stamps having been going ever since, together with 5 pans, running through from 18 to 20 tons of ore daily.

### EUREKA DISTRICT.

**HAMBURG.**—Eureka Sentinel, July 14: The furnace at the Atlas, which has been smelting Hamburg ore, will be run down to-day. An enormous impression prevails that the ore bodies in the Hamburg mine have given out. This is a mistake. They are as large and as rich in gold and silver as ever, but the percentage of lead is very small, so much so as to render the smelting very unprofitable. The Whim shaft, to the north of the main shaft, has furnished some six tons of ore per day, running very high in lead, and this has been mixed with ore from the chambers worked in the Pacific shaft. The ore was extracted from a drift running south 625 feet, bringing it in close proximity to the main shaft, but some 150 feet lower. Work had to be suspended in this shaft and level some three weeks ago on account of the foul air. Since that time the company have been competing with the other furnaces for the purchase of heavy lead ore, and finally come to the conclusion that it was better to shut down the furnace until such time as the proper connections are made. Mr. Powell informs us that they will probably start up again in about a month.

**THE LEMON MILL.**—The Lemon mill will be started by Messrs. Clark and Wallace to-morrow or Thursday. Extensive repairs have been made to the machinery since the gentlemen leased the property. It is expected that it will take a day or two after start-up is applied before the machinery will be in perfect running order, as it has become rusted by long disuse. The pans are not of the same pattern as those used in making the preliminary experiments at Salt Lake, but the gentlemen are confident that they can obtain good results from those now in the mill. The furnace is lessened the property. Consolidated fuel dust, and the process will be watched with great interest by all our mining and smelting experts.

### HUNTER DISTRICT.

**NEW FURNACE.**—Pioche Record, July 14: The pleasure of meeting James Day, just in from Hunter district. A 40-ton furnace is being erected, which will be started to work in September. About 60 men are at work for the Winnemucca company, which is composed of foreign capitalists, they having purchased from Bristol and Daggett. The company have the exclusive privilege of water, bringing it some two miles. A branch line of Oilier & Salisbury's Cherry Creek line stages was being run to Hunter this week. A postoffice has been established.

### MINERAL HILL DISTRICT.

**TO BE STARTED UP.**—Eureka Sentinel, July 14: Captain John Plummer, for a long time connected with the Lake Superior mines, arrived at Mineral Hill on Tuesday last,

and took charge of the English company's mining property at that place. The mine and mill have been the subject of much litigation among the English stockholders and was placed in the Courts of Chancery some time ago, since when no work has been done beyond the crushing of outside ores. Messrs. John Taylor & Co., who originally controlled the mine, have paid up all claims, thus removing it from the jurisdiction of courts. We understand that they do so on the report of a noted expert, and that they will expend a considerable amount of capital to improve the value of the property. Captain Plummer will employ quite a force of men in the various shafts and levels, and the diamond drill will be used to explore and determine the location of the ore bodies. Improved drilling machinery has been purchased and will soon be on the ground and at work.

### RAILROAD DISTRICT.

**PROSPECTS.**—Eureka Sentinel, July 12: Judge Watson, of Railroad district, has been in town since Sunday. The Judge speaks very encouragingly of the mineral wealth of Railroad district. He thinks that with a fair chance, in the way of capital to aid in the work of development, it would soon take rank as one of the very best mining camps in Eastern Nevada. The Judge himself has some splendid mines.

### REESE RIVER DISTRICT.

**EXCITEMENT.**—Reese River Reviville, July 12: For several days past there have been vague rumors of the discovery of rich new mines in the vicinity of Austin. The matter has been kept very quiet, but few beyond those directly interested knowing anything about it. But such things almost invariably leak out, and the departure to the discovery of a party with tools and supplies created a ripple of excitement. From where we could learn a woodchopper recently discovered the croppings of a ledge in the mountains above Silver creek and brought some of the rock into town and had it assayed, the result showing it to contain over \$500 per ton in silver. We have seen some of the croppings which were brought in. It is a porous quartz, carrying black sulphurets of silver and specks of horn silver and looks as if it might contain some gold. It is similar in appearance to the quartz in the croppings of the Comstock as found on the surface of the Gould & Curry mine and at Gold Hill, but does not look as if it would work \$500 per ton in silver, though it is very good croppings.

### SILVER CREEK DISTRICT.

**THE DISCOVERY.**—Reese River Reviville, July 14: From parties who returned from the new mining excitement at Silver creek, we got some particulars regarding the district. From T. W. Triplett we learn that James Heacock & Co. have located a ledge, which crops out for about 30 feet in length and about five feet in width, carrying ore which assays from \$300 to \$500 per ton. Other ledges have been located by other parties. Heacock & Co. have located a townsite near their ledge and also all the water in its immediate vicinity. Charles Richards, who has also visited the new mines, says the big ledge from which came the float which has been found on Silver creek for years past, have undoubtedly been discovered, but he is not prepared to speak as to their value.

### WHITE PINE DISTRICT.

**STRIKE.**—Eureka Sentinel, July 13: B. M. Howland informs us that a splendid development was made in the Stafford mine, on Treasure hill, last week. At a depth of 100 feet a 30-foot body of ore was struck, going from \$150 to \$300 per ton. The owners of the mine are F. M. Shinn, Sam. Paul and Johnny Flynn. They have commenced shipping ore to the mill of the English company at Eberhardt. The Stafford is now the only producing mine on the old mountain. The boys have stuck to it a long time, and are well deserving of the success which they are meeting with.

## Arizona.

**HACKBERRY.**—Arizona Enterprise, July 11: The latest news from the Hackberry in Mohave county, is in that the 430-ft level, south from the main incline, is in about 48 feet and shows a fine body of high grade ore. The character of the quartz and the ore extracted has greatly improved. The assays at present range from \$105 to \$452 per ton.

**FROM MR. HOLMES.**just arrived from Turkey creek, we learn that great activity is displayed in the different camps all over the district.

**THE PECK** continues to produce its usual quantity of high grade ore. On the Prince, Warrior and other claims in the district, steady work is carried on, and the mines are looking well.

**A NEW DISCOVERY** has just been made four miles southeast of town by Messrs. Leighton & Otto. Assays made from the croppings have gone as high as \$7,000 to the ton.

**MINING ON LYNN CREEK.**—This old camp, which in early days attracted thousands of eager gold seekers and produced hundreds of thousands of dollars, has, under the new departure after silver, to resume its ancient activity. The late strikes made in the district are attracting a great deal of attention in the mining world. The Zulu, Miriam, Maryland and other new finds are producing some wonderfully rich ore and giving every assurance of permanency as they are being sunk up.

**HONOLULU DISTRICT.**—On the Tex mine, Thompson & Schaffer are busy at work, and are taking out some very rich ore, which is being sacked ready for shipment. Foy & Co. are working on their claim and bringing to the surface some very high-grade ore. The great want of this district is a mill for the reduction of ores. Hundreds of tons of rock, which will run all the way from \$100 to \$300, is now lying on the surface, and the different mines waiting the coming of reduction works.

**BRADSHAW DISTRICT** has awakened from its long slumber and promises in a short time to regain its pristine glory. Its mines are many, large and rich; its facilities for milling cannot be excelled and its situation is all that could be wished for.

**HASAVATTA DISTRICT.**—The Senator is still yielding large quantities of fine ore, and the different stops and drifts throughout the mine never looked better. The mill keeps at work, steadily turning out its regular amount of bullion. On the Crook, Fiske & Co. are at work, and are getting out rock some of which will equal any ever taken from this very rich gold ledge. Owing to the scarcity of water the mill is not running at present.

**WAXBURG DISTRICT.**—The mining news from this section is of the most cheering character. The five-stamp mill is now at Peoples valley, and will be brought over as soon as the road is completed. In the meantime the claim owners of the district are busily at work getting out ore. Henry & Co. are running astraks, which runs from \$75 to \$100 per ton. To sum up the mining situation, the camps of Yavapai never presented a livelier appearance. From one end of the county to the other general activity prevails.

**FROM MOHAVE COUNTY** we learn that considerable activity is displayed by the miners in Cedar valley and other districts in the southern part of the county. Uroth the McCrackin there are 15 miners at work taking out ore. The dumps are full, and a large quantity of ore is now being shipped to the mill at the mouth of the river. The 10-stamp mill at Greenwood is running night and day and turning out a large quantity of bullion.

## Colorado.

**RED ELEPHANT.**—Colorado Miner, July 14: The miners and prospectors on this mine are still continuing to develop, surprising degree of activity and energy. Prospecting for general results is extensively indulged in, and with that determined persistence which is as necessary for success in the avocation of mining as in any other pursuit. New ground is broken nearly every day, and an earnest desire to become suddenly wealthy is a common characteristic of Red Elephant miners.

**FLAT IRON.**—Messrs. Lang, Arnold and Renwick are



## THE ENGINEER.

### Registering the Gauge of Railways.

It is of course very necessary that the gauge of the rails should be true and uniform under similar conditions. To determine this the track master's gauge is slow of application, and can only be applied to each point of the line at considerable intervals. We read that for controlling and graphically registering the width between the rails, Mr. J. Hochgrassl, assistant engineer of the European Turkish railways, of Usun Kopri, near Constantinople, proposes an apparatus which is by preference fastened to a trolley, and works automatically during the course of the same with great accuracy. The apparatus has two wheels of cast-iron provided with flanges. These wheels move with their axles each in two sockets riveted on an L iron, which is fastened on the said trolley by means of a pole. One wheel is by a projecting piece of the axle and by a pin with a retaining plate held in its place, whilst another wheel by means of the spiral spring slides to and fro according to the width between the rails. In the middle of the horizontal L iron is mounted a T-shaped support on which rests the registering apparatus and writing instrument. The whole frame is by means of small chains suspended on two flat springs, which project from the trolley whereon they are fastened. The suspension is effected in such a manner that the stationary wheel is always pressed against the rail, while the other wheel moves on the rail almost without any friction.

The sliding of the movable wheel corresponds to the actual width between the rails, and is communicated to the writing pen by means of a lever turning round its point. This lever is forked, and is placed with its forked end in a groove of the movable shaft. Between the writing pen and a metal plate moves a paper strap or hand. This strap is moved forward by passing between drums, one of which is turned by means of small wheels and an eccentric. The rolling of the paper strap on the cylinder is effected by means of another wheel; the axle of one wheel has a conical end. On this axle is a cylinder which by means of a screw or screws is pressed in such a manner that the said cylinder can slide on the axle according to the increasing diameter of the paper roll. A drum provided with rows of small pins draws on the paper strap by two parallel dotted lines the normal width between the rails, whilst the deviations from the normal width are drawn by a single line. The beginnings of curves and the like can easily be marked on the paper band by the attendant on the trolley. The aforesaid pressure screws have for their purpose to regulate the rotation of the said cylinder and drum.

### What Has Been Done in the Mississippi.

Chief Engineer James B. Eads has just made a report to the South Pass Company, from which we take a concise statement of what has thus far been done with the jetties: Our works were begun two years ago in an unused outlet of the Mississippi river and have necessarily disturbed the regimen governing the outflow to the sea of an enormous volume of water; but the theories upon which they were based have been fully vindicated by the results produced; and it is now manifest that entire and complete success will reward our labors. Among the prominent results developed by our operations are the following:

1. The concentration of the water flowing across the sand-bar at the mouth of the pass by the jetties created a channel over 200 feet wide, in no place less than 20 feet deep, where only about eight feet previously existed.
2. The concentration of the water flowing over the shoal in the river at the head of the pass created a channel over 400 feet wide, in no part of it less than 20 feet deep, with the central part 30 feet, where but 14 feet previously existed.
3. During the time in which a portion of the flow into the pass was interrupted by the works at its head, and the current consequently slackened, a temporary deposit took place in the pass and between the jetties.
4. The gradual restoration of the normal flow into the pass through the new channel at its head has already begun to enlarge the pass again, and has, since this restored flow commenced, removed from between the jetties within the past three months over half a million cubic yards of deposit, and given through more than half the length of the jetties a much larger and deeper channel than ever previously existed, the size of which is already throughout more than 2,000 feet, 28 feet by 300 feet, or that required to entitle us to the fifth payment from the United States, while many hundred feet of it exceeds 30 by 350 feet.
5. The gulf current athwart the jettied mouth of the pass effectually prevents the re-formation of the bar in advance of the jetties by deepening the outer slope of the bar, and sweeps away any such portion of the discharged sediment as the river current fails to carry to unknown distances seaward.
6. The Mississippi river at the head of the passes, where it has a width of over 9,000 feet, is brought under complete control by our works, which are so designed as to enable us to increase or limit the discharge into our pass,

if hereafter necessary, with but little additional outlay.

7. Finally, I may add with absolute certainty, that this entire system of works is now so far completed that no financial difficulties can intervene to arrest the processes of nature which are constantly operating to enlarge and perfect the desired channel through them.

### A Field for American Enterprise.

A communication from Mr. James V. Thomas in the New York Times presents the following facts bearing on the proposed isthmus canal: "You have perceived that in this communication I address myself to two arguments; the first, that of navigation, and the other what I may call colonial development. A Nicaraguan canal would make New York the central commercial city of the world, and make San Francisco her associate. But it would do more; it would give American planters, mechanics and merchants an immediate and a near field to create another India in place of that which is rapidly forestalling even our domestic productions. Hot and heathen India, as we presume to call it, sent nearly 3,300,000 hundred-weight of wheat to England last year—one-sixth as much as the United States, one-third as much as Russia. No land can compete with the infinitely versatile conquest of England in the East, except tropical America. With a foresight that was almost unparalleled in national economy the British government began, at the close of the American revolution, to compensate in India for the loss of North America. The year of Cornwallis's defeat at Yorktown signaled the final defeat of Hyder Ali, and the Marquis Cornwallis was sent to preside over India before the adoption of our Constitution. In 1853 the East India Company ceased to exist, and 18 years thereafter the queen added to the jewels of her crown that of the 'Great Mogul.' No portion of her dominions is more easily ruled; none gives so extensive a field of investment and return. The British revenue from India is \$250,000,000 a year, or nearly the total cost of operating the United States Government. The British army in India employs and subsists 200,000 of Her Majesty's subjects, and controls 240,000,000 human beings. They make a commerce of \$500,000,000 a year, cotton, jute, rice, tea and indigo leading. They give employment to 19,000 vessels and to 6,500 miles of Indian railroad, in which \$500,000,000 find profitable investment. India at first was a most discouraging region for enterprise, with its terrible climate and dense and fierce population. In Spanish America, which repeats nearly every natural production of India, and adds many others exclusively its own, there are less than 30,000,000 people, more than two-thirds of whom live on the Pacific slope; they are weary of revolutions, ripe for orderly government, hospitable to strangers, and more frugal than ourselves. They lack those things in which we are most redundant—organizing power, machinery, practical purpose and influence over European commerce.

### Suspension Bridges Invented 1,600 Years Ago.

The most remarkable evidence of the mechanical science and skill of the Chinese at this early period is to be found in their suspended bridges, the invention of which is assigned by "Thornton's History of China" to the Han dynasty. According to the concurrent testimony of all their historical and geographical writers, Shang-leang, the commander-in-chief of the army under Kaou-tsoo, the first of the Hans, undertook and completed the formation of roads through the mountainous province of Shen-se, to the west of the capital. Hitherto its lofty hills and deep valleys had rendered communication difficult and circuitous. With a body of 100,000 laborers he cut passages over the mountains, throwing the removed soil into the valleys, and where this was not sufficient to raise the road to the required height he constructed bridges, which rested on pillars or abutments. In other places he conceived and accomplished the daring project of suspending a bridge from one mountain to another across a deep chasm. These bridges, which are called by the Chinese writers, very appropriately, "flying bridges," and represented to be numerous at the present day, are sometimes so high that they cannot be traversed without alarm. One still existing in Shen-se stretches 400 feet from mountain to mountain, over a chasm of 500 feet. Most of these flying bridges are so wide that four horsemen can ride on them abreast, and balustrades are placed on each side to protect travelers. It is by means improbable (as M. Panthier suggests), that as the missionaries in China made known the fact more than a century and a half ago, that the Chinese had suspension bridges, and that many of them were of iron, the hint may have been taken from thence for similar constructions by European engineers.

THE WASHINGTON MONUMENT.—At a recent meeting of the Washington Monument Association, General Meigs submitted a plan to terminate the present structure with a metallic spire 140 feet high, making a total length of 442 feet, and a column resembling the tower in the public square of Venice. The additional weight will be 4,147,000 pounds. General Meigs also approved the plan of Larkin G. Mead, to complete the monument by placing a colossal statue of Washington upon the present structure. This figure of Washington will be 85 feet in height.

### Systematic Mining.

We shall not name examples, as it might be inferred that in our opinion all others were badly managed. But it must be admitted by every candid judge that a considerable portion of our mines are not systematically worked. In many cases this is due to a lack of experience or judgment on the part of the managers, and in others there is a lack of capital to put the mine in proper condition so far as timbering, buildings, hoisting facilities and roads are concerned.

Systematic mining does not necessarily imply an extensive mine, a large force or an expensive administration. A prospector who locates and records before tracing the course of his vein, begins without system and not infrequently loses part of his lode by its passing outside of his side lines. The miner who sinks a small corkscrew shaft from the surface, works without system. If he expects the lode to prove a good one, he should make his shaft a size and shape that will not require any change or enlargement. It costs no more to do it well than to do it badly. If he does not expect the lode to prove valuable he should not waste his time upon it. There should be a well considered plan of working from the very commencement. The custom of working a little here and a little there in a dilatory sort of a way, trusting to luck to "strike it" at some point, or of working first one lode and then another (when there is no annual work to be provided for), with the idea of increasing the number of chances, has frittered away many a man's means or time and left him poorer than he began. The better and more successful way is to choose the best lode and stick to that. (If the writer had learned the foregoing some years earlier than he did, he would not now in all probability be writing this article. He learned, and at some cost, "how not to do it.") By this course, so it has been proved by observation and experience, the miner of moderate means has more chances in his favor than by scattering his means and time in many places.

There is no little unsystematic and therefore unprofitable management in large mines. The most prominent instances are those where the manager in endeavoring to shirk the expense of the dead work, incurs a larger expense before he proceeds far. For instance, instead of sinking his main shaft after it passes out of the ore course and running levels to develop the ore, he goes out to the center of the ore course in the level and sinks a windlass shaft, through which he works, running levels from that and hoisting all the ore from levels and stopes below the upper level, then wheels or trams to the shaft, thus requiring two or three times as much handling as if the shaft had been sunk and the level run in a systematic way. Then before he can proceed far the water or depth of the windlass shaft will compel him to sink his main shaft and connect with the workings. This is one of several ways of making a temporary raise, losing more in the end than is gained by the makeshift.—Georgetown Courier.

### The South Pacific Coast Railroad.

A correspondent of the Alameda Independent says: I went down to Newark to gather what news I could in regard to the new railroad. I saw the leading man there, who said he had not given any news to any paper, and did not wish the affairs of the road to appear in print, but he said he would give me a few items of interest. He stated that the rails of the road were laid from Dumbarton point to Los Gatos, a distance of 30 miles, and that the road was in running order from Newark to Los Gatos, the remainder of the road to the point having to be ballasted. They have got a force of 140 Chinamen, besides the bosses, instead of the 300, which statement appeared in the columns of your last issue. On the main road from Newark to Alameda the work is being pushed forward as rapidly as possible by 100 Chinamen, who are doing the grading. They have got it graded a little over a mile from Newark, and they expect to have the rails laid in five or six weeks to Alvarado if they have no bother about the right of way. The road will run between Alvarado and the county bridge, across the creek about a quarter of a mile from the town. The road is one of the strongest ever built for a narrow-gauge. The ties are set about 20 inches apart on coarse gravel, and when the rails are laid thereon it makes a very fine road. The rails of this road are iron, and are the heaviest of any narrow-gauge road, weighing 50 pounds to the yard. The rolling stock of the road consists of four passenger coaches, two baggage, 70 platform, and ten box cars, together with hand and section cars, also three locomotives, weighing from 16 to 22 tons respectively, and all of the Baldwin build. They were made at Philadelphia, Pa., are next to the largest narrow-gauge engines that are made, and are all supplied with the Westinghouse air-brakes of the latest patent. They have had two of these locomotives running for about a year, and they have given perfect satisfaction in every respect.

#### Newark

Is destined to be the headquarters of the road, for at this place the shops are situated. The dimensions of the shops are as follows: car-shop, 54x150; machine-shop, 42x150; blacksmith-shop, 22x34, and the round-house is large enough to hold seven locomotives. The car and machine shops are just having the machinery put in, which is of the most improved pattern. The motive power for running these shops is a

large stationary engine in one corner of the machine-shop. It was built by Chas. W. Ewien & Bros., Philadelphia, for the road. The cylinder is 14 inches in diameter and 24-inch stroke; the fly-wheel is nine feet in diameter with 20-inch face, and weighs 3,000 pounds; the total weight when in working order is 8,000 pounds, and was purchased at a cost of \$1,350. These shops will be in running order in a week or ten days, when Messrs. Carter Bros., who manufacture the cars for the road, will put their workmen at work making the passenger coaches, which will be finished off inside with black walnut, primavera and tomana, the last two being brought from South America. The seats are iron, with nickel-plated arms and strips over the back, and are finely upholstered in green and crimson velvet. The cars are eight feet broad and 36 long, with capacity for holding 48 passengers. The road will be open for business on or about the first of next year.

### New Mines at the North End.

For a long time many of our mining experts have been skeptical as to the continuity of the great Comstock ore channel beyond the Sierra Nevada mine. That matter has, however, been definitely settled beyond all further doubt by the late developments on the 1150-foot level of the Utah. The ore vein on the level has been proven to be 139 feet in width of solid quartz of the best mineral-bearing character. The clay walls are heavy, and the entire ledge is as finely developed, well defined and perfect as at any point on the lode.

This proves that, although there may be now and then a partial break in the great vein, it still continues in all its strength still farther to the northwest than it has ever yet been developed. Our mining men are quick to discern and appreciate the prospective value of mines whose locations are likely to be enhanced by these discoveries, and already preparations are getting under way to start the work of development on claims that, although really valuable, have lain idle for years past, for the want of capital to work them. Among these is the North Union, which comprises the original claims of the North Utah, Utah Consolidated, North Alamosa, and the old I. O. O. F. These mines lie to the northward of the Utah, and are now consolidated under the name of the North Union. Considerable surface work has been done on each claim. The North Alamosa has a tunnel run a distance of 40 feet into the mountain side, which cuts a ledge 25 feet in width, which assays from \$15 to \$20 per ton. Another tunnel, run in the North Utah ground a distance of 100 feet, shows the vein matter to be over 100 feet in width, from which assays were obtained ranging from \$10 to \$140 per ton. We hope these companies will soon succeed in getting well to work, that we may be able to know more of the north end of the great Comstock silver cleft. Every mine on the Comstock was once a mere prospecting claim, and many of those that have since developed rich bonanzas had in the beginning no better surface prospects than these claims.—Gold Hill News.

MUD SPRINGS DISTRICT.—A new mining district has just been organized, concerning which the *Tuscarora Review* has the following: "F. L. Perkins, Tom Parker, John Walker and Henry Miller returned from the new camp, which has created some excitement in this place during the last ten days, and from them we glean the following information: The camp is located eight miles west from Simon's ranch, on the Carlin road and across the line in Eureka county. The ore on top is principally base and requires roasting, and consists of copper-glance and antimonial silver, but assays very high for surface ore. The camp was named Mud Springs, and Tom Parker elected Recorder. The Mineral Point, located by F. L. Perkins, Tom Parker and others, is 6 feet wide; the Stanwix, by John Walker and Wm. Hampson, is 24 feet wide; the Colorado, by Henry Miller, is 24 feet wide. Jack Pearson and H. McCann are there and have several good locations."

THE NEVADA TRIBUNE says negotiations are now pending by Wm. M. Lent, on account of some San Francisco capitalists, for the purchase of 4,200 feet of mining ground on Last Chance Hill, Aurora, Esmeralda county. This ground was formerly worked by the Rio Del Monte, Pond and other companies, to the depth of about 150 feet, and large quantities of bullion taken out. The successful development of the mines on Bodie hill, of which the Standard has found ore fully as rich in the 550-foot level as it had on the 200-foot level, makes the chances almost certain that the mine on Last Chance hill will prove the same. The price paid has not transpired, but we learn that it is in the neighborhood of \$100 per foot.

THE JACARILLA MINES.—A genuine excitement has begun over the Jacarilla placer mines, in New Mexico. There is no water whatever on the ground, and all operations must be carried on by dry washing, as it is called. The top ground of these diggings yields from 10 to 25 cents to the pan. The deposits are very deep and have been known for some years, but the complete absence of water has prevented their exploration. Several parties of miners from Southern Colorado have recently started for the new camp. A new process for working the gravel, by means of a machine known as Ginn's patent dry washer, has lately been tested on the ground, and is reported to have given great satisfaction.



## Where Iron and Where Steel?

"What is iron and what is steel?" we might have said in the above head, with the same application of reply. In all the tests of iron and steel, their character and constitutions, there seem to have been facts of what each specimen contains in the way of ingredients, but only in a small way has any attempt been made to discover what and how much of each ingredient is necessary for the production of certain kinds of metals. If the metallurgist will preface all his experiments with mixing the different ingredients found in steel and iron, and thus discover what is necessary to and what is not necessary or injurious to, then his further operations will be intelligible to himself and others. The questions, what is steel and what is iron? are not yet answered. It may be known what certain specimens contain by way of mineral characteristics, but while we know the character thus far, there is something else lacking to enable a uniform production, except by using such and such native-found ingredients in proportions found to produce, without being able to eliminate from or add to other ingredients differing in a small degree. To knowingly produce uniform iron and of a desired character is not yet possible. When will it be?

To know where and how far to use iron and how far steel, or both, is in the same unknown future as the production of these perfectly adapted metals. If their characteristics, as related to heat and cold, hardness and softness, strength or brittleness, were perfectly known, then the use of either or both would be readily determined. The only definition yet to be given to iron is that it is one of the metallic elements, and which exists under various circumstances and in connection with various chemical ingredients, some beneficial and some hurtful. The term steel indicates that this metallic element has lost or taken on some additional ingredients better adapting it to mechanical uses. All steel is iron, but not all iron is steel. There are no chemical ingredients in steel not found in iron, but many in iron not good in steel.

The only knowledge thus far is the slow one of experience. A bridge falls, but the reason is hard to discover. An iron or steel boiler or fire-box burns and corrodes and bulges and crystallizes, and years of time, and perhaps fortunes and lives are lost to learn that the iron or steel was not of a character to stand the labor against it. Direct tests for direct knowledge is postponed year by year, when all the expense of such tests would be regained in a short time were the tests known. It is a simple matter to construct a boiler of a part of two or three kinds of iron, two or three kinds of steel, and steel and iron variously combined, and at once apply the test. If iron is better than steel, or steel better than iron, or steel outside or inside of iron better than either alone, then let us have the knowledge.

If high or low steel or iron of different character for structures will best resist the action of a jarring burden, and the heat and cold of climate, and fierce compression or tensile strain, then let us know it. The St. Louis bridge is built to resist compression, as the spans are arches; the Brooklyn bridge is built to resist tensile strain, as the spans are suspension. It has been proved that the finer the metal the greater the resistance from compression, but it can hardly be true that the hardest steel will better resist strain than a finer quality of homogeneous iron. The Niagara bridge is of iron, and aside from a slight corrosion is in perfect condition.

These tests are the coming points to be established, and the fact that certain uses are made of certain metals of unknown characteristics, and certain results produced from such use, is no definite idea of what would result at another time or in another way. Good and bad usage, and unknown characteristics, are thus leaving the true knowledge of iron and steel in doubt. Experiments by private individuals are always attended with delay and distrust, for the feeling of conservatism and jealousy is still abroad.—*Age of Steel.*

**THE MAICHE BATTERY.**—The inventor states that when his platinized carbon battery is charged with water acidulated with 10 per cent. of sulphuric acid, a zinc surface of 25 square centimeters is sufficient for the production of electric light. The electromotive force is, however, only about two-thirds as great as Bunsen's. By charging with bichromate of potash, he makes his battery the most intense of all, for the two forces are combined, and it possesses an electromotive force superior to that of the bichromate, while furnishing a double quantity of electricity. His battery has, therefore, the advantage of either being charged with simple acidulated water, or with the addition of the bichromate, which makes it the most powerful known electro-generator.

**PRICES PAID FOR DIGGING COAL.**—The *Coal Trade Journal* says: Wilkinsburg, Pa., two and a half cents per bushel. Saltsburg, Pa., two and three-quarters cents per bushel. Saw Mill Run, Pa., 48 cents per ton. Vienna, O., 50 cents a ton, cutting three feet of coal, and move half as much slate free. Neshannock, Pa., one place reported as working at \$1.25 per day. Sewickley, Pa., two and a quarter cents per bushel.

## USEFUL INFORMATION.

**CONVERTING COTTON INTO WOOL AND LINEN.** The system of parchmenting paper is now applied to cotton, and according to the *Age of Steel*, promises a very important result. 1. Parchmented cotton as a substitute for wool. The raw cotton, well cleaned, is left for 24 hours in a solution of one part concentrated sulphuric acid, one part of sulphate of glycerine, and three parts water, at a temperature of 63½° F. It is then wrung between glass rollers until the test paper goes no longer red. After drying the fibers will be found to have acquired most of the qualities of sheep's wool, and for using this cotton for spinning, weaving, or dyeing, it has only to be wrapped (beaten into?) in felt. When fabrics are made exclusively with the transformed material, and finally have been animalized in the usual way by milk, ammonia, oil, and lime, the fabric cannot be distinguished from genuine woolen goods, except by the smell given off in burning them, since the lanified cotton smells just like the natural one. The super properties acquired by the cotton through this process justify the expectation that it will supersede all the ingredients hitherto used for producing half-woolen goods. 2. Cotton parchment as a substitute for linen. Cotton yarns which have been steeped for 24 hours in a mixture of two parts concentrated sulphuric acid, and three parts water at 63½° F., is then pressed and dried as above, and will not only have acquired every property of linen yarn, but it is also stronger and less corruptible than the latter. The difference in price, especially in fine numbers such as used for cambrics, being very considerable, the process would also prove commercially successful in this branch of industry.

**MANUFACTURE OF PORTLAND CEMENT.**—An English exchange says that an important improvement in the manufacture of portland cement has been patented by Messrs. White, of Swancombe, by which a better quality of material is obtained and the cost of manufacture is considerably reduced. For this purpose they take chalk and clay in the natural state in which they are found, and without the admixture of water they obtain an intimate mixture of these materials by placing them together into a hopper, from which they pass to a series of pairs of crushing rollers. The materials as they leave the hopper have first to pass through a pair of pairs of fluted crushing rollers, from which they pass to other pairs of plain rollers, placed closer and closer together, and running at increased surface speeds. By this means the materials are reduced to a thin sheet, the chalk within which is in a thoroughly disintegrated state and mixed with the clay. After the materials have thus been crushed and mixed together by means of rollers they may be molded into bricks to be burnt in any ordinary manner, no fuel being mixed up with the materials of which the cement is composed.

**VALUE OF THE EUCALYPTUS.**—We learn from the *Meteorological Magazine* that, at the Easter reunion at the Sorbonne, some information was given by Dr. de Pietra Santra, a delegate from the Climatological Society of Algiers, as to the results of an investigation made in Algeria to ascertain the importance and value of the *Eucalyptus globulus* in relation to public health. It appears that reports were received from 50 localities where the aggregate number of blue gum trees is nearly 1,000,000, and from these reports the following conclusions have been drawn: 1. It is incontestably proved that the eucalyptus possesses sanitary influence; for 2, wherever it has been cultivated intermittent fever has considerably decreased both in intensity and in frequency; and 3, marshy and uncultivated lands have thus been rendered healthy and quite transformed. Similar results have been obtained in Corsica, where it is computed that in the present year there will be upwards of 600,000 plants of eucalyptus in full growth.

**WHAT A MAN CARRIES UP-STAIRS.**—In the course of an article on elevators the *Polytechnic Review* remarks: Few consider that stair-climbing necessitates an actual lifting of the whole weight through a vertical distance equal to the height of the stairs. A man weighing 160 pounds in walking up a flight of 16 steps, each with an eight-inch rise (corresponding to a 12-foot ceiling), in a time of 20 seconds has lifted 1,920 pounds a foot high in that time—nearly a ton weight. To climb to the top of a four-story building—say 52 feet vertically to the fourth floor—in 90 seconds represents the lifting of 8,300 pounds a foot high in that time. Reduced to minute foot-pounds, this equals 5,533 pounds lifted a foot high in a minute, or one-sixth horse-power.

**ARTIFICIAL FUEL.**—An improved fuel has been proposed, consisting of peat dust, 125 parts; slimy deposits of rivers, 10 parts; anthracite dust, 1,000 parts; schist oil waste, 100 parts; and dry coal slack, 120 parts. Another improved fuel is suggested by Mr. Mallee, consisting of pulverized charcoal waste, 80 parts, with 20 parts of pulverized charcoal, which are mixed together, and he then adds five parts of nitric acid, two parts of nitrate of potash, and five parts of gum arabic. The product is considered to be specially adapted for cooking stoves, as it causes neither smoke nor smell. It can be lighted with a match like touchwood, and covered with the other portions of the fuel the combustion continues.

## Notes for Metal Workers.

From the pages of a recent issue of the *American Jeweler and Silversmith* we collect the following hints of practice:

**Silver alloys.**—No. 1. Silver, 11 ounces, two pennyweights; copper, 18 pennyweights. No. 2. Silver, one ounce; copper, one pennyweight, 12 grains. No. 3. Silver, one ounce; copper, five pennyweights. A solder for the above is as follows: Silver, 16 pennyweights; copper, 12 grains; pin-brass three pennyweights, 12 grains.

**Silver solder, for enameling.**—Silver, 14 pennyweights; copper, eight pennyweights.

**Quicksilver solder.**—Silver, one ounce; pin-brass, 10 pennyweights; bar tin, two pennyweights.

**Common silver, for chains.**—Silver, six ounces; copper, four ounces.

A bright gold tinge may be given to silver by steeping for a suitable length of time in a weak solution of sulphuric acid water, strongly impregnated with iron rust.

**Polishing tortoiseshell and ivory.**—Putty powder (oxide of tin) will put a beautiful polish on ivory, and would possibly do for tortoiseshell. Apply the putty powder on a piece of flannel with water or methylated spirits and elbow grease, and finish off with dry powder.

As nickeling is replacing silvering in certain cases, so there are cases where nickeling may be itself replaced for many articles of small value. The manipulation is very simple. Coarse, rasped, or granulated zinc is boiled for some time in a mixture of three parts, by weight, of sal ammoniac and 10 of water. The object immersed and stirred up with a zinc rod. The deposit is silvery bright, and resists mechanical action as well as a coating of nickel. This process can be recommended for goods that are meant for second coating of some other metal, since any other is easily deposited upon zinc.

A gold lac, remarkable for its great hardness and beautiful color, on being analyzed by Dr. R. Kayser, Nuremberg, gave as its constituents picric acid and boric acid. Thereupon a clear shellac solution was mixed with picric acid and half per cent. of crystallized boric acid, each being previously dissolved in alcohol, and the resulting lac possessed all the advantages of the former one.

**TO REMOVE RUST.**—To extract rust from steel, immerse the article to be cleaned in a solution of one-half ounce cyanide of potassium to a wine glass full of water until the rust and dirt disappear. Then clean by means of a tooth brush with a paste composed of cyanide of potassium, castile soap, whitening, and water.

**BELGIAN METAL.**—Belgian anti-friction metal is composed of copper 20, tin four, antimony one-half, lead one-fourth parts. Mix all the other ingredients before adding the copper.

## GOOD HEALTH.

## Care of the Eyes.

Do not read or write before sun-up or after sun-down. Let the light fall upon the page from behind. Never read while lying down. Those whose eyes are weak should never read or sew by candle or gas light, nor by twilight. Suffer nothing to be applied to them unless by the special advice of an experienced physician. If the lids stick together in the morning on waking up, moisten them with the saliva, it softens and dissolves the matter sooner than any liquid known. The best and safest treatment for most affections of the eyes is rest, especially if weak or inflamed, rest from reading, writing or sewing, from every use of them which requires close observation, spending a large portion of the time out of doors, as then, large objects are mostly viewed. Persevere in this for weeks and months if necessary, and if not then relieved, consult a physician.

Avoid reading on horseback or in rail cars or any wheeled vehicle while in motion. Many persons will find that in reading before breakfast an effort is required to keep the sight clear, but after breakfast no such difficulty is experienced; the reason is, the eye under such circumstances is more or less inflamed, that is, has too much blood about it, but nature calls that excess of blood away to the stomach after eating, to enable it to perform its work more thoroughly. Therefore, persons with weak eyes should not read or write or do fine sewing on an empty stomach. Our preceptor, Professor Dudley, who is among the very first of living surgeons, used often say, "Young gentleman, never let anything touch the eye or ear stronger than lukewarm water." We have but one sight to lose, its preservation merits all our care, and it is unwise to tamper with, or experiment upon an organ so indispensable to our comfort, happiness and usefulness.—*Hall's Journal.*

**A SMOKER'S DISEASE.**—M. Mauriac, Surgeon of the Hospital du Midi, has just added another to the special diseases of smokers. He has described, under the title of *plaque des fumeurs*, a morbid change of mucous membrane of the tongue and mouth, a special psoriasis. This lesion may degenerate into epithelioma; and according to M. Mauriac, cancer of the lips and tongue has often no other origin than this. Both are common among men, and very rare, as might be supposed, among women.

**WHAT IS FEVER?**—Dr. H. F. A. Goodridge, in a very interesting sketch in the *British Medical Journal*, of fever pathology, sums up our positive knowledge as follows: The characteristic elevation of temperature of the body in fever is mainly due to increased production of heat. Besides the increased production of heat there is a disorder of nutrition, an abnormal disintegration of the body, and particularly of the muscular tissue, evinced, on the one hand, by increased excretion of urea and potash salts, of carbonic acid, and perhaps also by water; and on the other by progressive loss of body weight. The increased production of heat occurring at a time when a principal source of normal heat production, viz.: the food ingested, is all but completely cut off, must have its origin in the abnormal disintegration of tissue. The converse may also hold good to a greater or less extent, there being thus action and re-action. However probable may be the hypothesis of the intervention of the nervous system, the connecting link between the entrance into the organism of the fever excitant, the pyrogenic matter (be this *contagium febrile*, or what it may be,) and the onset of the characteristic phenomena, have not yet been demonstrated. In short, the proximate cause of fever remains undetermined.

**DEATH FROM POISON OAK.**—A young man named George Kelley died yesterday under peculiar circumstances. On Sunday last he drove a party out to Alum Rock, and while there it is said drank two or three glasses of beer and wandered around for some time at the Rock. The next day he complained of soreness of the face, and Mrs. Sikes, the wife of the hackman, in whose family he was employed as hostler gave him some ammonia to apply upon it. Becoming worse physicians were called, though he soon became insensible and continued to fail until yesterday, when death ensued. Deceased was about eighteen years old, and bore a good reputation. The funeral will take place from the residence of his father, James Kelley, on the Alameda, at 2 P. M. to-day. The case is spoken of by physicians as an extraordinary one, poison oak seldom causing more than a few days' inconvenience. However, some are more susceptible to its influence than others. It is thought Kelley's system was out of order else the poison would not have resulted fatally.—*San Jose Mercury.*

**MOTHERS, STUDY HYGIENE.**—Writes Mrs. Diaz in her charming little volume of "A Domestic Problem": "Will not you who know the inevitable influence of the mother upon her children—will you see to it that some portion of the time devoted to her education is spent in preparing for her life-work? Suppose the young women of 30 years ago had been thoroughly instructed in hygienic laws, would not the effects of such instruction be perceptible in our present health rates and death rates? Let us begin now to affect the health rates and death rates of 30 years hence, and it will do no harm to instruct young men in these matters. Even now there comes to me a report from the State Board of Health, in which it is shown, by facts and figures, how our death rates are affected by ignorance—ignorance as exhibited in the locating, building and ventilating of dwelling-houses, drainage, situation of wells, planting of trees, choice of food and cooking of the same, as well as the management of children. Can any subjects compare in importance with these? For humanity's sake, let our young people take time enough from their Latin dictionaries to learn how to keep themselves alive."

**BURNING KITCHEN REFUSE.**—In the city where the dweller is dependent upon the dilatory swill carrier to come for the refuse, it is better to burn the refuse in the kitchen stove or range than to allow it to lie around the area a source of pests and pestilence. We have for some time practiced burning, and find much truth in the following from the *Sanitarian*: "Among the internal rules and regulations of our kitchen, one of the most preceptory is the absolute prohibition of *swill tubs* and *swill gath-ers*, and instead thereof, *daily burning* all peashucks, corn-cobs, potato-peelings, fruit-parings and the like, together with all greasy table and kitchen scraps, which render the mixture readily combustible. The odors are all carried off with the smoke up the chimney, and with ordinary care for a good fire in the range, and daily combustion—so as never to have large accumulations—ashes only are the convenient result."

**DISEASE AMONG POTTERS.**—The statement is made that on incinerating the lungs of a potter, it was found that there was present in the ashes left, the great amount of 45% of silica, 18% of alumina and 5% of the oxide of iron, thus showing to what an enormous extent finely divided clay is being constantly breathed by potters, a circumstance causing premature death. It is also stated that in Wales and England the number of persons engaged in the manufacture of pottery is about 45,000. Among the males the census shows the mortality to have been no less than 38% higher than the average death rate for the males of the whole community above the age of 15, this increase relating principally to those in the very prime of life.

**LAUGHTER.**—A good laugh occasionally is better than a whole apothecary's shop of medicine. It is an act of wisdom; it shakes the cobwebs out of a man's brains and hypochondria from his ribs far more effectually than either champagne or blue pills.



# MINING SCIENTIFIC PRESS

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Our latest forms go to press on Thursday evening.

SAN FRANCISCO:

Saturday Morning, July 21, 1877.

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## The Week.

We give in another column the statement of the bonanza mines for the first half of the fiscal year, the publication of which is the principal feature in connection with mining operations. The bullion shipment for the present month is not included in the statement. The total expense of ore production, milling, etc., is under \$30 per ton. We are without our usual summary from the Comstock this week, owing to the delay on the railroad, caused by the fire at Cisco. News from the scene of the Indian war in Idaho is more favorable than of late, Joseph being represented as in retreat with his band before the troops. It is expected that the chief will shortly surrender. The railroad strike trouble in West Virginia has assumed somewhat unusual dimensions. The President has issued a proclamation calling on all good citizens not to take part in the unlawful proceedings. U. S. troops have been sent to preserve peace, but the "strikers" seem desperate, and there will be further trouble before it is all over. The men claim that the wages offered are not sufficient to support themselves and families.

COPPER is selling in Liverpool as follows: Good ordinary brands of bars, £68 15s to £69; special brands, £69 10s to £70; ore, 13s 6d to 13s 9d per unit.

## Prospecting.

The city is full of idle people looking for work; and other cities and towns on the coast are similarly afflicted. Times are hard and these men profess to be willing to take hold of anything they can find to do. We can suggest to some of these idle persons, without families, that there is a splendid field for their exertions in the interior mining counties, for sober men, in the line of prospecting. It does not need an expert to prospect, as some suppose, although it requires experience to properly work a mine. If a man has some experience, so much the better, although some miners believe that a new hand has better luck in finding claims than the old hands. "Greenhorn's luck" is proverbial among the miners, and a good many instances of the kind have occurred of late.

It does not require much money to prospect. Rough clothes and plain food are not expensive, and men will spend more of their savings in a month looking for work than they will in three months in the mountains while prospecting. They must have food while idle as well as while at work. It looks, moreover, as affairs are in this city at present, as if they had as good a chance to find a claim in the mines as to find a situation in towns. At all events it is worth trying, and there is a chance to make as much in six months as they might here in as many years.

There are many districts where there are good chances for prospectors. In Nevada county there have been several strikes of late, and concerning prospecting there the Nevada Gazette says: "The success which has been met with in this district by those who have been engaged in prospecting during the past two years ought to encourage others who have the time or means, to go to work. It is true that many have worked long and discovered nothing. Probably all who hunt for gold-bearing leads will not find them, but the proportion of lucky men engaged in the business is as great as in any occupation. There have been several valuable mines opened here during the past 18 months. Any one of them would pay for all the labor that has been expended in the district during that time in prospecting, at regular rates of wages. That there are many other paying ledges undiscovered is past dispute. The frequent discoveries recently made prove it. There is a perfect network of veins traversing the whole section. Many of them, if worked upon in the right place, will be found to contain rich ore. All ledges have pay shutters if they can be found. A failure to strike it in one place will not prove that good rock does not exist in the same lead at another place. Perseverance will reward the prospector in the end. Work was about to be suspended in several of the discoveries a few days before rich rock was found. All this section needs is the opening of a few more paying mines to make everything prosperous. The only way to have them opened is to diligently search for them. Business men should lend every assistance in their power to the industrious prospector. Their success means success for business houses. It is better to trust a hard working man who is penniless than the man about town who has no occupation, but it is not always done. The man who is willing to spend his time and labor in search of gold, ought at least to be supplied with what he wants to eat by those who will, if he succeeds, be indirectly benefited by his discoveries. Prospecting companies consisting of half a dozen persons can be formed and kept up with but little expense to each individual composing them, with a good prospect of reaping a rich reward thereby. Idle men, if any are here, ought to be kept at work when their labor will, after awhile, bring about what all so much desire."

## Primitive Smelting Operations.

The trite old saying about necessity being the maternal parent of those things which the Patent Office was created to take charge of, is nowhere more frequently verified than in the mining regions. There men are thrown on their own resources to a greater extent than elsewhere, and have to make things answer more purposes than they were intended for. They have to improvise all sorts of contrivances out of rude materials, make metal answer for wood, and wood for metal, and exercise their ingenuity in many ways. A glance through any of the books treating of mines and mining appliances will show numerous useful inventions which were the results of these conditions.

In metallurgical operations, where capital is required, the miners try all sorts of dodges to get the money out of the ore in a small way. One of the latest of which we have heard is being applied at the Mineral King mines, in Tulare county. The miners facetiously term it the "Fryer process," because a frying pan is the principal appliance. It seems to succeed better than that from which it takes its name. A correspondent of the Visalia Delta describes in detail the operation: First, a common blacksmith forge is obtained, and second, a common iron frying pan is luted on the inside an inch or more thick with clay, and then placed about three inches below the nozzle of the bellows; around said frying pan are laid common rock to the height of eight or ten inches; the hollow, or chimney, is then filled with charcoal, fire being placed at the bottom, the wind blast turned on, and the smelting commences by lay-

ing on the top of coal the pulverized ores. In this way much of the lead and some of the silver is carried off by volatilization. Notwithstanding this, however, the fact remains that the ores of this district are easily reduced to rich merchantable bullion, and several bars of metal, weighing about a pound each, composed of about 70% of pure silver, have been made here from the following ores: White Chief, Chihuahua, Dolly Varden, and Grecian Bend, each of them with a little iron ore to neutralize the sulphur, and a little lime rock to thin the slag, (both of which ingredients are found in great abundance in the mines). The ore was easily reduced to a rich marketable bullion, and were it not for the fact that this process can be carried on for a short time only, owing to the molten slag having no place through which it can be drawn off, but soon chills above and around the blast, we, as miners, would soon be shipping bullion.

## Items of Interest from the Mines.

We give below items of interest from prominent mines, most of which are collated from letters of the respective Superintendents on file at the offices in this city:

The water in the Savage is 102 feet below the 1900-foot level.

In the Justice mine, the general run of the ground in face of east drift 1150-foot level is of a much softer nature than any heretofore discovered on this level, being no less than pure birdseye porphyry. Upraise on 1000-foot level continues to develop the same uniform grade ore it has passed through for a height of forty feet; the stopes from each end of the upraise are looking well.

The Winfield mill is running steadily on Ophir ore.

In the Ophir the stopes on the 1400 and 1500-foot levels still continue to look and yield well. The old fillings on the 1500-foot level are giving some ore which will pay \$30 per ton. Both inclines are progressing rapidly.

At the Golden Chariot (Idaho), they have started sinking the bottom of the shaft.

There is in the last few days an increase of quartz in the face of the south winze of the Con. Imperial, which gives low assays. The formation in face of cross-cut in centre of mine is looking well. The mine is very much hotter since the hot weather set in; it has increased about 4 degrees in the last week.

Chollar turned out 679 tons of ore last week, averaging \$23 per ton.

The Eureka Consolidated mine is looking splendid throughout all the different workings where ore is in sight. The 5th level ore body seems to increase in extent, showing no diminution notwithstanding the large quantities of ore extracted. The 6th level ore body looks first-rate. The furnaces are turning out from twelve to thirteen bars each of bullion daily.

The 1900-foot station of the Hale & Norcross has been enlarged and entirely retimbered.

The Superintendent of "Solid Silver" writes under great excitement that the ledge at the bottom of the winze shows the finest prospect on the Comstock.

At the Eureka (Grass Valley), which has closed down permanently, they are burning the blanket tables, riffle boxes and floors to get the gold out. A gold bar weighing 612 ounces was shipped last week.

In level No. 3, south of the Empire (Grass Valley), the ledge is very small and the ground hard.

In the Overman the drift being run north on 1400-level has been extended 28 feet during the week; a distance of 33 feet to run yet before a connection will be made with the Belcher south drift on 1600-foot level. When this connection is completed it will furnish a good circulation of air, and greatly facilitate the work.

They have 200 tons of good ore on the dumps of the Coso Con.

They have struck the ledge in cross-cut on the fifth level of the Empire (Idaho), running 40 feet north of the furthest workings on the sixth level. It is very rich in free gold.

The ore from the Andes is averaging about \$20 per ton.

The new Grand Prize mill has been started up.

THE Bank of California statement for July 1st, as required by law, has been published: The gross assets are given at \$9,583,522, of which \$5,000,000 is due to stockholders for capital stock paid in, \$4,547,705 to depositors, \$19,053 to sundry Eastern banks and bankers, and \$26,763 to profit and loss account. The cash and bullion assets on the 1st of January were \$2,878,792, and on July 1st \$2,116,649. The comparison shows a loss of \$762,000, though as compared with July 1st, 1876, the loss is only \$123,000. The line of deposits is \$1,390,850 less than it was six months ago. The assets of the bank are regarded as being in a more healthful condition than they have been at any time in over two years.

FOUR Chinamen, who have been working in the mines at Smartsville, passed through Wheatland last Wednesday with \$18,000 in their possession as the result of their labors. They brought with them two shotguns and three revolvers as a protection against robbery.

AUSTIN has got a mining excitement. Some ore assaying \$500 to the ton was lately discovered near Silver Creek, and a grand rush is the result.

## Sanitary Cellars.

The fact is fast coming to be realized that humanity is responsible for much of its own sickness and premature death, and it is no longer necessary to offer an apology for presenting to public consideration a subject in which, more than any other, the general public is vitally interested. Proper foundation for human habitations is one of the greatest needs of the age. It is not enough that we build our houses on healthful sites and where we have pure air and water; we must make provisions for preventing these sites from becoming foul, as every unprotected house site invariably must. The house we live in should be so carefully constructed in all its parts that the health of the occupants can only be assailed from outside causes and cannot be endangered from any imperfect interior construction in ventilation, heating, draining, etc.

Although in California, from the nature of the climate, cellars are not considered as essential as in the Eastern States and most of the houses here are constructed without them, it is nevertheless the fact that under such houses there is a great deal of dampness, producing miasmatic exhalations. It is a well established fact that the principal cause of fever is a humid miasmatic state of the atmosphere, produced by the presence of an excess of moisture in the ground, from which poisonous exhalations constantly arise, and carrying into the system of those who inhale it a virus, which, if not sufficiently intense to produce fever, has such a disturbing effect on the functions of some organs as to weaken the general system.

In many large cities fine residences are made unhealthy by the escape from leaky sewers. In this city, where so many buildings are constructed on made ground, sufficient attention has not been paid to this important matter. The usual cemented cellar is little protection, the cement concrete having had from 10 to 20% of its bulk composed of water when laid. As it dries out, the space occupied by the water is gradually occupied by air until the entire concrete is porous and offers little resistance to the passage of air or gases. Impossible as it may seem, it is an easily demonstrated fact that through even the heat of concrete when dry, air can be blown readily by the ordinary power of the lungs. Water is a ready solvent and absorbent of most all dead matter, and in connection with heat soon putrefies animal and vegetable matter. As a solvent it distributes it through the soil which becomes saturated in time with the foul accumulations of fetid matter. Many epidemics have been solely traced to this saturation of the soil on which the city is built. The saturation from privies in the yards is a very serious matter. Pettenkoffer in his investigations found that in removing the contents of privy vaults about 1-10th of the refuse matter was carried away, and 9-10ths was absorbed by the ground.

The nature of the soil on which a building stands has more or less to do with the health of the residents. The connection of fever and ague with soil and moisture and with the obstructed decomposition of vegetable matter in saturated ground or in moist air are almost universally recognized. Many houses in cities are built in a hole in the rock 10 feet or more below the level of the street or upon ground filled in to meet the street grades. In the first the surface water naturally flows down between the walls of the houses and saturates the walls and the cellar bottom and become a producer of malaria. In the other the vegetable matter buried up is constantly sending up gases as fast as they are evolved by the vegetable decomposition, so that no cellar is in any fair sense healthy until made absolutely impervious to the penetration of moisture and gas through the bottoms and side-walls. As an evidence of the unhealthfulness of ordinary cellars, several large cities have laws restricting their use as places of abode. In this city and others, in the business portions, where space is very valuable, modern architects have seen fit to construct the lower stories several feet below the street, and in such places people spend half their lives. If proper precautions to keep out the dampness are not taken, such buildings cannot by any means be healthy, and are as injurious as poorly constructed cellars in dwelling houses. Mr. T. New, of 32 John street, New York, has a method of constructing cellars which is superior to those commonly in vogue, and which secures them against water and dampness, and those interested in the question will do well to correspond with him. This cellar is constructed with a water and air-tight lining of alternate layers of felt (saturated with bitumen) and asphaltic cement, which is protected by artificial stone and other materials. We shall probably describe this improvement more in detail, with the aid of an engraving, shortly.

THE Nevada Bank, of San Francisco, has the largest paid up capital of any bank in the United States. The capital stock is owned by five persons, Jas. C. Flood, Wm. S. O'Brien, Jas. G. Fair and John W. Mackay owning 23,750 shares each. These lots are valued at \$2,375,000 each. Louis McLane owns 5,000 shares, valued at \$500,000, making the total capital \$10,000,000. The reserve fund is \$2,000,000. Most, if not all, of this money, came from the "bonanza mines" on the Comstock—the Consolidated Virginia and California.



## Temperature and Organic Remains in Tahoe and Echo Lakes.

At the regular meeting of the California Academy of Sciences held on Monday evening last, Dr. James Blake, of Napa county, read the following paper "On the Temperature and Organic Remains in Lake Tahoe and Echo lake."

During my stay in the vicinity of these mountain lakes, I took the opportunity of ascertaining their temperature at different depths, by means of a Cassell's deep sea thermometer and also of using the two net and dredge in both lakes. Owing to the overturning of the water in which I was descending from the mountains, I unfortunately lost the note book containing the record of my observations, so that I can now only relate from memory the principal facts observed. As regards the temperature, I found the surface water of Lake Tahoe at the temperature of 62°. This was in the middle of July, at a time when the temperature of the air was ranging from 36° to 76°. Near the south shore the temperature of the water would rise 4° or 5° during the hotter part of the day, but would be again 62° at sunrise, although the air was 36°. This higher temperature was found only in the shallower water at the south end of the lake, where the depth for half a mile from the shore gradually increases to about 160 feet. Beyond the edge of this bank the depth suddenly increases so that the next sounding, at not more than 300 yards from the edge of the bank, gave a depth of 560 feet, with a bottom temperature of 39.7°, the temperature at the surface being 62°. Owing to the sounding machine getting out of order, I was unable to ascertain the temperature at greater depths, but as 39.4° is the temperature at which water attains its greatest density, it is probable that no lower temperature would be found even at the deepest part of the lake.

In Echo lake, which is at an elevation of 1,000 feet above Lake Tahoe, and about 150 feet deep in the deepest part, the temperature of the water at the bottom at a depth of 145 feet was 41.3°. This was in the month of July, at a time when snow was still found in spots at a few feet from the shores of the lake. The surface temperature was from 56° to 62°, the temperature of air ranging from 30° to 70°. At the time the soundings were taken the temperature of the water at the surface was 62°, of the air 68°.

In using the tow net I found, both in Lake Tahoe and in Echo lake, the surface of the water swarming with cirripeds, although the number in Lake Tahoe far exceeded that in Echo lake. The net when towed near the surface only contained the perfect insect, but at a depth of 20 feet from the surface nothing but the ova in different phases of development were obtained, and not a perfect insect. This fact probably explains the absence of these insects in running water, as it would seem that the nva only meet with the conditions favorable for their development in water where they can remain at a depth from the surface, a condition that cannot be secured in running water. Owing to an accident I met with shortly after my return from the mountains, the objects collected from the dredge were not examined and have since been mislaid.

At the depth of 560 feet I found the bottom of Lake Tahoe covered with the same deposit of disintegrated granite which is found so extensively at the south end of the valley and at other points on the shores of the lake. The larger part of the bed of the lake is formed probably of the same material, and not, as in Echo lakes, of a hard, rocky bottom, although at many points near the shore the bottom can be seen to be formed by boulders. There is, however, this difference between the two lakes, that whilst the basins of Echo lakes were evidently ground out by ice action, Lake Tahoe for ages before the ice epoch had been the receptacle of the washings from the mountain masses that surround it, and during the ice period I believe glaciers had little to do in modifying it. Even as regards Emerald bay and Fallen Leaf lake, I cannot agree with Prof. LeConte in considering them as formed by ice action. There can be no doubt but that the shores of these lakes are formed to a great extent of moraine matter and also the bars that separate them from the main lake, but that ice should scoop out these basins at a depth of from 1,000 to 2,000 feet beneath the surface of the water, I think very improbable. I believe both Fallen Leaf lake and Emerald bay to be deep mountain fissures, modified by ice action. I would also here correct another mistake into which Prof. LeConte seems to have fallen, by regarding these smaller lakes as the result of ice action. He observes that the scooping action of the ice is in these lakes at the upper end, whilst the glacial deposits are at the lower end. In Echo lake, which has undoubtedly been scooped out by ice action, the upper end of the lake is quite shallow and slopes off very gradually, with a perfectly smooth bottom, the greatest depth in the lake being reached at two-thirds of the distance from the upper end.

The Martin White company has received its first shipment of fine bullion, amounting to \$10,000. The run of the cupel furnace for ten days yielded \$15,000.

The Dayton mine has \$140,000 worth of machinery, etc., and at the last quotations of the stock the mine was only valued at \$25,000.

## Manufacture of Lamps and Lanterns.

Among the manufacturing industries of this city which ministers to the comfort and convenience of the people, and cheapens the price of articles of necessity, is that of lamp and lantern making. At first sight it would seem that this industry must be limited in extent and the products of few varieties. This is by no means the case, however, as there are so many uses to which these articles are put, and so many styles needed to suit the demand for different purposes, that their manufacture has to be carried on by skilled workmen and on a large scale. The only large manufactory in this line in the city is that of Emile Boesch, No. 569 Mission street, and from this place are supplied the numberless kinds of lamps, lanterns, reflectors, etc., used by the wholesale and retail trade.

Mr. Boesch is himself a practical workman and understands the business in all its details, having been in it here for some nine years, besides being previously engaged in it in France. When he started business first in this city he began on a small scale, but has gradually extended his operations until now he occupies a commodious factory, employing improved machinery for saving labor and time. He has a fine steam engine, which enables him to do work promptly and at prices which only a large house, having every facility, can afford. Mr.

These works are also supplied with machinery for metal spinning. This department has lately been extended so as to make copper halls, bar room boilers, shower hats, etc., to order. Mr. Boesch now does all his own work in this line, and does it also for the trade to order. At this factory a great variety of other styles of lamps are made. The sign lamps made are peculiar and in extensive use. They are turned out in a variety of forms for various purposes. There are also a variety of forms of patent silvered corrugated glass reflectors for lighting up show windows, halls, etc. In fact, every possible style of lamp and lantern as made for hotels, residences, churches, ships, railroads, cars, mills, etc. Mr. Boesch has created the business here, and has succeeded in stopping the importation of this class of articles, showing a most successful home industry.

## An Indian Fishery.

Our illustration shows the style of fishing practiced some years ago by the Piute Indians in Nevada. A tourist of a score of years ago gives the following account: As we rounded a little knoll we discovered the entire rancheria of Indians in a bend of the river making preparations to catch fish, and we at once rode down to witness the sport, which proved to be a novel scene. Stretching nearly across the stream was a rocky bar, over which a very little of the water rippled, while the main body of it made



INDIANS FISHING IN WALKER RIVER.

Boesch has, since he was established in business here, perfected nine different patents on articles in his line, besides introducing many minor improvements.

One of the most important of these improvements designed by Mr. Boesch is that relating to the lanterns used in hydraulic mining operations. Owing to the fact that the miners are compelled to take advantage of every inch of water that flows, they work night and day during the mining season. At night, of course, they must have light for their operations. The old fashioned way was to have brush fires, which, however, have long been superseded by lamps. Ordinary lamps, no matter how large or well made, did not fill the requirements, and Mr. Boesch has succeeded in perfected one now

a sudden bend around, keeping close to the opposite bank. Just above the bar was a deep eddy, and above this the stream was broad, shallow and rapid, and skirted on each side with a thick growth of low, withy willow. Here of this willow the Indians made a drag about two feet in diameter and in length sufficient to reach across the stream. On the bar they had built a slight wall of the small rock in the form of a half circle, at the lower side of which was a willow fish-trap, the water being only a few inches or a foot deep inside the circle. When all was ready they swung the drag out across the stream and let it sweep down to the eddy when they all gathered in above it and keeping it near the bottom swept it through to the shallow bar, bringing the two ends to join the wall, when they had all the fish "corralled" within the circle, then pressing their knees upon the drag to keep it firmly to the bottom, they commenced the exciting sport of pulling out the fish, which as a matter of course tried to find a place of egress at the upper side. The suckers, which constituted a greater portion of the fish, were easily taken in this way; but the trout, more wily, flipped lightly over the drag and away upstream again. The scene they presented as they knelt over the drag, men and squaws, old and young mixed up indiscriminately, and carried the fish to their mouths as they caught them to hit their heads, frequently holding them in their teeth for some minutes, the poor suckers twisting themselves spasmodically in their death agonies, was truly ludicrous and amusing. A few of the fish entered the trap, and at the last, one big fellow seemed to have got an idea of the danger that awaited him on either hand, and flipped about in the center of the pool, foiling for a long time all their efforts to catch him, they in the meantime getting highly excited, but finally a squaw pounced upon him and held him up in triumph.



BOESCH'S HYDRAULIC MINING LAMP.

almost universally used. An engraving of this is shown on this page.

This is similar in appearance to a locomotive head-light, but is superior to it. The reflector is the same in both, but the burner for the mining lamp is better than in the other case. Mr. Boesch has made several styles of the lamp, but the engraving shows the most improved. The reflector is of furnished silver-plated metal. The lamp will effectually and clearly light up a gravel bank at a distance of 200 or 300 feet, which is the distance required. It is so arranged that while the lamp is stationary the reflector may be moved so as to throw the light up or down, and send it to any particular part of the bank to which the nozzle is directed. The small staple shown at the bottom of the reflector serves to keep the reflector in the desired position. This appliance is now deemed indispensable in all the large gravel mines, and Mr. Boesch makes numbers of them.

## The Yellow Jacket Mine.

The receipts of the Yellow Jacket mine for the fiscal year ending June 30th, were \$403,258, of which \$36,000 was from assessments. The disbursements include \$125,510 for labor, \$54,000 for wood, \$46,000 for mine supplies, \$118,000 for the new shaft, etc.

The following is a summary of work done in the mine during the past year: Drifts run, 2,212 feet; winzes sunk, 665 feet; re-timbered, 550 feet of old drifts, 130 feet of winzes and re-timbered 1130-foot station and 100 feet of main shaft between the 1020 and 1130-foot levels; cribbed it with 12x12 timber. Have also bored 1,337 feet of holes with the diamond drill for prospect purposes, thereby saving the cost of many feet of drifts. The machinery and workings of the old mine are, and have been, kept in good repair. The Superintendent's report says: Most of our prospecting work has been done on the 1930, 2030 and 2200-foot levels, and there still remains 300 feet south from the north line which has not been prospected below the 1940-foot level, and 250 feet north of the south end that has not been prospected below the 1740-foot level. The fear of cutting water has prevented the latter. We find on the 2030-foot level, the ledge fully 466 feet wide without reaching the east wall. The whole vein is filled with metal-bearing porphyry and quartz, all of it showing by assay the presence of gold and silver. On the 1930 and 2030-foot levels we found seams of ore varying in size (though ton narrow and mixed to pay to extract) assaying from \$10 to \$400 per ton. On the 2200-foot level we have not yet drifted sufficiently far from the winze to find the same. On the 2200-foot level we find the vein almost perfectly dry and quite easy to work, and through having good ventilation we find no difficulty from the heat of the ground, which by test is fully 140° Fahrenheit.

The new shaft is down 800 feet and new hoisting machinery is on the ground. They are also erecting a 40,000-gallon tank to supply the boilers and for protection from fire. Concerning the new shaft, Mr. Taylor, the Superintendent, says: When it reaches the present working levels of the mine, I feel confident that we can accomplish as much work as at present for less than 60% of the present cost, and our neighbors on the north will all be able to considerably lessen their expenses by working through the same. Though our disbursements seem large, the utmost economy has been observed, and I am in hopes, judging from the favorable appearance of the vein, that the stockholders will soon be rewarded by the discovery of a paying body of ore.

## The Coming Exhibition.

The managers of the Twelfth Industrial Exhibition, under the auspices of the Mechanics' Institute, are very busy arranging the details of the different departments. They are now at work appointing the committees on awards. The exposition building is being cleared out and arranged for the reception of goods. The horticultural garden will have many new features this year, and will be of special interest. A large landscape painting, covering the whole of one end of this building, is to be put up. A number of rockeries are being built also, which will be very handsome.

Those persons who intend to exhibit and who have not applied for space, had better do so immediately or they will lose their chance. The applications for space have exceeded those of any previous exhibition, already. A number of persons who made displays at the Centennial intend bringing their goods out here, so it behooves our local manufacturers and agents to put the best foot forward and get up as creditable displays as possible. Our citizens should do all in their power to extend the interest of our local exposition, which really represents a greater area of territory than any of the State exhibitions, or any except an international one. The managers of the fair are confident that the coming exposition will excel any previous efforts in every respect, and those persons who should exhibit and fail to apply for space in time, will be disappointed if they make any further delay. The exhibition will open without fail on the 7th of August.

**THE CHOLLAR-POTOSI.**—This mine produced last year \$710,941 in bullion and \$192,202 was received from assessments. The total receipts, including \$100,000 borrowed money, were \$1,042,684. The average yield of the ore was \$18.69 per ton. The cost of mining and milling was \$14.99, leaving a profit of \$3.70 per ton on the ore. The expenses of prospecting were, however, \$3.16 per ton on this ore, while the disbursements on account of the new combination shaft were \$4.72 per ton, which added to the expenses, show a loss of \$4.18 per ton. Twenty per cent. of the assay value of the ore was lost in the tailings. The mine has produced in twelve years 553,000 tons of ore, producing \$13,839,600 in bullion, about 38 per cent. of which was gold and 62 silver. For the past eleven years the mine has paid 44 dividends, aggregating \$3,079,925, and levied eleven assessments, aggregating \$1,358,502, leaving a balance in favor of stockholders of \$1,721,323. Of the gross bullion, 25 per cent. have been paid in dividends.

The North Fork mining company of Forest City have sent a ton of sulphurets to Nevada City to be worked by Oscar Maltman. The rock from this mine is very rich.



### Jablochkoff's Electric Candle.

Most of our readers are doubtless aware of the waste that goes on at the surface of many of our mines and collieries, where large heaps of coal, sometimes containing over three tons, are often burnt nightly, in order to afford light to the men engaged in loading into trucks the contents of the trams as they are brought up from below, and this because no cheap and trustworthy light could be found as a substitute for the above-named wasteful arrangement. The electric light was long ago proposed as a means of illuminating large spaces, but difficulties of detail have hitherto prevented its general application. The light obtained by passing the electric current through two carbon points kept at a certain distance apart, was indeed brilliant enough; but, owing to its being concentrated at one point, the very intensity was sometimes embarrassing, and also caused the projection of dark shadows that much impaired the efficiency of the light for manual operations. Again, owing to the difficulty of keeping the carbon points at the proper distance apart for preserving constant the luminous voltaic arc, the light was subject to variations of intensity, or even to total extinction, that raised a serious objection to its common use. Nor was it every found possible, with an electric lamp of the ordinary form, to maintain more than one light in the same electric circuit and with the same dynamo machine.

It was reserved for M. Paul Jablochkoff, an officer in the Russian engineering service, to introduce that element of simplicity into electric illumination which has made it easily and practically applicable to the purposes of every day commerce and industry. In previous electric lights, the carbon points were placed in a vertical line, and a complicated arrangement of clock-work was necessary to keep them at the proper distance apart. In the new electric candle, however, the carbons are placed side by side, with a non-conducting substance between them, which not only keeps constant the length of the voltaic arc but also causes a diffusion of light, owing to the insulating substance throwing out a flame instead of being merely a luminous point. The light is also rendered soft and pleasant to the eye by means of a shade of ground glass, so that the shadows of surrounding objects are not so marked as with other electric lights. This arrangement also enables several lights to be kept going in the same electrical circuit and by one induction machine. In this way the light is better distributed, so as thoroughly to illuminate a given area. The electric candle consists of two rods of carbon, circular in section, held by brass tubes joined together with cement, and having between them a non-conducting substance of which kaolin is the base. There is also a switch arrangement whereby one candle can be drawn out of the circuit when nearly exhausted and a fresh one substituted in its place without stopping the induction machine or more than momentarily intercepting the light.

We were invited last Friday evening to witness some experiments in illumination with these new electric candles at the West India Dock; and may say at once they were highly satisfactory, notwithstanding the temporary arrangements necessarily adopted for driving the magneto-electrical machine. Under a canvas stretched over an open court-yard were erected four standards, each carrying one of the candles, and together forming a parallelogram 45 by 20 feet. The electricity was produced by an induction machine of the Alliance Company, Paris, driven by a small portable engine. At a few minutes after 9 P. M. the electric current was passed through the circuit, which included the four candles. The whole space was thereupon lighted up with a beautifully soft and subdued light, of such power that, notwithstanding a loss of 50 per cent. owing to the shades, small print could be read with ease at twenty paces outside the parallelogram. If, at first, there were slight irregularities, which would be called flickering in a lamp or ordinary candle, these were doubtless due to the fact that the electrical current was not of uniform intensity, owing to the difficulty of keeping the portable engine, fitted only with an ordinary governor, at a constant speed. After remaining in action for a quarter of an hour, contact was broken; and four gas lamps, with four burners each, provided with silvered reflectors, were lighted, in order to show the contrast, which was very marked.

The party then ascended to the top of one of the warehouses, which was illuminated sufficiently for all practical purposes, with three electric lights, each equal to about sixty normal candles. They then proceeded on board a vessel lying alongside, which was thoroughly lighted up by a portable lamp on the quarter deck, and a fixed light on shore. It was manifest that the operations of loading and unloading could be carried on with this form of electric light, as well by night as by day, thus saving many a pound in demurrage. The glasses in the warehouse and on board were not frosted, but had a slightly blue tint.

The last demonstration was given with a modified lamp composed of a slip of kaolin suitably prepared, and put in connection with the secondary coil of the dynamo machine. This light, though not so intense as that previously described is, of course, more cheaply produced, and, it is believed, will be more suitable for office and domestic illumination.

About three hundred persons, including Mr. Warren Delarue, F. R. S., Sir J. McGarel Hogg, M. P., Captain Sale, R. E., Mr. E. J. Reid, M. P., Major de Winton, and a large number of

scientific men were present, and all appeared thoroughly satisfied with the successful issue of the demonstration. We believe these will be repeated, as far as practicable, at the South Kensington museum on an early occasion, when the general public will have an opportunity of witnessing them.

Some data will naturally be expected with regard to the cost of this new light. The four electric candles burning in the yard require an engine power equal to that of two horses, which in London costs about 4d. an hour. In addition to this, four lights consume about 1/4 yard of candle per hour, which may be valued at 1s.; therefore the whole cost in steam power and candles may be reckoned at 1s. 4d. per hour for the four electric lights. As these lights are equal to 400 gas jets, which in London would cost about 6s., a considerable saving is effected in current expenditure.

M. Jablochkoff's invention has been taken up by the *Société Anonyme des spécialités mécaniques réunies*, Paris, the director of which is M. Denayrouze, the inventor of the well-known mine respirator and lamp.—*Colliery Guardian*.

**SETTING A WATCH.**—If you want to be very accurate and are setting your watch by the stroke of the city clock bell, you must allow one second for every 1,100 feet the sound has to traverse from the bell to your ear.

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**APPRECIATION ABROAD.**—We copy the following from the *Mining and Monetary Gazette*, of London, England: "We deemed it advisable, as affording valuable information to our readers, to publish in recent issues of *The Gazette*, the full text of the 'United States Mining Laws and Instructions,' by the Commissioner of General Land Office," taken from our talented contemporary, *THE MINING AND SCIENTIFIC PRESS*, of San Francisco. The documents have now been issued in a handsomely bound volume by Messrs. Dewey & Co., the publishers of our transatlantic contemporary, and it will be found very useful to those already interested in American mines, and to others who may be tempted to embark in that enterprise in the States."

SAN FRANCISCO, CAL., Jan. 23d, 1877.  
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Continued from Page 37.

running an adit on the lode from the gulch, and are in 90 feet. On Tuesday they struck a nice vein of ore, of good grade, some of it showing native silver.

**FREE AMERICA.**—At this time the mine furnishes employment for forty to forty-five men. Two parties of lessees, Messrs. McNamara and Myers, are working the west end. A flume sixty rods long bringing water from the Young America gulch for the use of the engine, &c., will soon be completed. The new fifteen horse power hoisting engine is in place; and the combined engine house and ore house, measuring 124x40 feet, is nearly finished. The engine shaft, which is sunk but to the first level, is a little over one hundred feet deep. It is heavily cribbed from top to bottom, is 8x3½ feet in the clear, and follows the dip of the vein, which inclines at an angle of about thirty degrees from the perpendicular, and ranges south thirty degrees.

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This lode matter is clear white quartz, and the ore carries gray copper, antimony, copper pyrites, black sulphurets, and native silver. The dip of the vein is not less than forty-five degrees.

## Idaho.

**EMPIRE.**—Owyhee *Adalanche*, July 14: The developments in the Empire continue to be quite satisfactory. In the progress of operations on the ledge, from which so much fine rock has been extracted, the prospects have been such as to justify the belief that the richest portion of the ore body here is yet to be encountered. There are two large ledges in this mine, the old or main ledge having a straight course from the surface of the vicinity down. The other ledge inclines toward the old one at an angle of about 45°, and the junction is believed by practical men to be effected at a point about 700 feet below the surface. The slopes are yielding a fine supply of good ore, and there seems to be plenty of it in almost every direction. We visited the mine recently in company with Superintendent Crutcher, and were astonished to witness the ease displayed in chipping off rich seams, which seemed to abound at various points along the ledge known as the Hidden Treasure. This ledge seems to be nowhere less than two feet in width, and at many points branches three feet deep, being so liberally streaked with gold in some places as to give the lead the appearance of a most remarkable development.

**GOLDEN CHARIOT.**—At the Golden Chariot sinking operations commenced on Monday morning. The works are now in thorough condition for business, and the enterprising men will go forward with the least possible delay. The Superintendent has not a large but has a very efficient corps of workmen to aid him in this undertaking, on the final success of the developments connected with which the future welfare of the camp to a very considerable extent depends.

**SINKING** operations are now in progress in the Potosi. Much of the rock recently taken out will average 300 to the ton. There is a quantity of material ready for crushing, which will be forwarded to the mill next week.

A good supply of rich ore has been taken from the Belle Peck recently, and in every part of the mine where work is in progress, the indications are equally favorable. Some inconvenience has been experienced recently among the workmen in consequence of the existence of foul air in the mine. The trouble is about to be remedied.

The Henrietta mine, at Wagontown, has been turning out some very rich rock recently. It is looking better than ever.

**FRANK LEPLLEY** recently crushed two tons of rock from his mine in Wagontown, which yielded \$1,000. There is said to be abundance of good rock left in that mine, as well as other mines in that locality.

## Oregon.

**NEW GOLD MINES.**—*Mountaineer*, June 7: New gold mines have lately been opened by a party of miners, called the Grand Ronde Beaver Creek ditch and mining company, situated on Beaver creek, in the Blue mountains, about 20 miles west of Ore Dell, in Union county. From Mr. E. R. Horner, the foreman of the mine, who was in town on Thursday, we learn that the gravel is extensive, and that it prospects from 40 to 50 colors to the pan, with plenty of water and sufficient fall for erecting hydraulic apparatus. While in town, he purchased a hydraulic pipe from T. W. Miller, the tin and copper smith of The Dalles, and also made arrangements for getting a large amount of iron pipe made to be used instead of hose. The company is now engaged in completing a ditch to Ronde river, which will give them water during the entire year.

## Utah.

**SHAUNTEE.**—*Cor. Salt Lake Tribune*, July 14: The Frisco furnace is running finely and making plenty of bullion. The new Godde smelter is nearing completion and will be started to start up on the 1st of August. It is to be of the latest pattern, and will make our old furnaces look like Dutch ovens in comparison. The Shauntee furnace still remains idle. The miners are indignant at the idea of cutting wages down in this part, when the price of provisions is double what it is in Salt Lake. They say bring down the price of goods and then wages will follow. The mines are all looking about the same, and it is expected that four furnaces will start on the 1st of August, and run steadily from that on in Beaver county.

## Meetings and Elections.

**OVERMAN M. Co.**—July 13th. Directors—President, Geo. W. Beyer; Vice-President, R. F. Morrow; Trustees, Jos. Clark, J. H. Dohinson, R. Wegener; Secretary, Geo. D. Edwards; Superintendent, Chas. Forman.

**UNION CO.**—July 10th. Trustees—John W. Coleman, Robert Sherwood (President), R. M. Graves, L. T. Lazure, J. B. Russell, J. M. Buffington (Secretary). The receipts for the year were \$64,615, and expenses, \$51,263; balance on hand, \$13,346.

**NEWARK S. M. Co.**—July 16th. Trustees—A. H. Yazzell (President), Geo. F. Reeves, Jr., E. L. Wagner, Wm. Ashman, J. A. Fairweather. Officers—W. H. Allen, Jr., Secretary.

**YELLOW JACKET S. M. Co.**—July 16th. Trustees—J. G. Fair, Geo. Wallace, F. A. Trille, A. King and T. J. Taylor. The shareholders have chosen President and Superintendent, Vice-President, Geo. Wallace; Secretary, P. Ennes; Transfer Secretary, Jas. Newlands; Treasurer, Bank of Nevada.

**ROCK ISLAND M. Co.**—July 17th. Trustees—E. F. Stone, R. N. Graves, W. S. Lyle, J. M. Walker, W. F. Myers; President, E. F. Stone; Secretary, J. W. Clark.

**YOLGANO G. M. Co.**—July 10th. Trustees: Geo. Muck, A. Peck, Lucius Smith, John Eckart, Albert Heath. Officers—Secretary, E. A. Peck.

The hoisting works of the Sundermier mine, Calaveras county, were destroyed by fire last week. A candle in a miner's candlestick fell down and set the place on fire. The watchman was asleep and came near being burned up. The loss of the hoisting works will fall heavily upon the owners of the mine, who can ill afford to replace them. The works were entirely new, having been in operation but a few weeks, and very favorable progress was being made in the development of the mine.

## General News Items.

The rinderpest has broken out at Bethnal Green, England.

**GEN. McDOWELL** has telegraphed the War Department a strong defense of Gen. Kautz against the reports of the Arizona agents of the Indian Office.

**NICOPOLIS** has surrendered to the Russian army. The Cossacks have succeeded in crossing the Balkans and getting within 200 miles of Constantinople.

An effort is being made to obtain money in England at a low rate of interest for rebuilding St. Johns, New Brunswick. Two millions are wanted.

The State Department has ordered a thorough investigation of the reported Spanish outrage on the schooner *Rising Sun*, with a view to obtain full reparation, should the published statements be verified.

**SECRETARY McCARY** is reported as saying that, in case Mexico alleges the fact of invasion and protests or demands reparation, she has already furnished us a precedent, and therefore we have equal cause of complaint.

The training ship *Jamestown* went to sea Monday morning. The ship will proceed to Hilo, where the boys will be given an opportunity to visit the volcanoes, Mauna Loa and Mauna Kea, and will not return to port till November.

The Choctaw and Chickasaw Indian nations have brought suit against the Missouri, Kansas and Texas railroad on a claim of \$700,000 for ties, timber, masonry, coal, etc., used in the construction of that road. Plaintiffs claim that the property belongs to the nations in common, and not to individuals, who have no right to dispose of it in any way.

The Treasury Department has issued the 51st call for the redemption of 5-20 bonds of 1865 and consols of 1865. The call is for \$10,000,000, of which \$7,000,000 are coupon and \$3,000,000 registered bonds. Principal and interest will be paid at the Treasury Department on and after the 16th of October next and interest will cease on that day.

## EXTENSION OF THE SIGNAL SERVICE.

The Eastern people are calling for the extension of the signal service. And no wonder, for this is what a local paper says was done in a Pennsylvania town: "A man was blown two miles; a cow was carried 200 yards and dashed to death; the roof of a barn wound like a cord around a tree a quarter of a mile distant; osage hedges torn up; a tree two feet in diameter cut off as though it had been sawed; a heavy axle torn from a wagon and shot like an arrow through an adjoining house, and a number of other freaks were performed almost as startling." The paper from which we quote draws from these frightful instances the conclusion that the signal service of the country should be so extended that we would be able to announce the hurricane hours beforehand, so that people could anchor things down. It says: Signal stations should be increased, more scientific men should be employed, and by Government expense, the conclusions reached by these savants be daily telegraphed to the press. In nothing is the steady advance of this age better exemplified than in this matter of deciding from the atmospheric conditions surrounding a district what is going on in other districts, and what may be expected in the near future. It partakes of the marvelous, if not of the infinite, when man has reached conclusions in science which enable him to look out upon a clear sky and say with certainty: "A hurricane is on the march; it is yet a thousand miles away, but it will be here to-morrow at noon, accompanied with rain and hail and measureless destruction." Such a triumph of science should be held as divine, as something given in mercy to mankind, and the governments of the earth should build to it temples on every mountain top and on every ocean's shore.

## RAILROADS MUST COMPLY WITH THE LAW.

We read a decision by Judge McKee to the effect that the railroads must comply with the request of the railway commission, created two years ago, and furnish them with correct reports of their business, so that the reports may be laid before the Legislature and serve as a basis for whatever legislation the facts may seem to warrant. This is one more link in the chain which will bring the railways to a realization that they are creatures of the State and cannot rise higher than their Creator. Judge McKee decides wisely that because the State wants this information there is no reason to infer it means to use it unconstitutionally. The people are decided that they will know more about the management of railroads and how it is that peerless fortunes can be built up by individuals and yet the railroads be pronounced unprofitable.

**GOOD WORK.**—During the thirty days of the fiscal month of the Consolidated Virginia the California mill crushed 9,524 tons of ore, being an average of over 317 tons per day. The *News* says this is not only the largest amount ever reduced by any of the Comstock mills during a like number of days, but is the best average per stamp yet recorded, being over five tons per day for each stamp run.

## National Immigration Bureau.

The Fairmount Park Commissioners, who represent the city of Philadelphia, have given to Mr. Lee Crandall the use of Machinery hall, in Fairmount park—a building which covers over 14 acres—for the establishment of a National Immigration Bureau.

In this building there will be exhibited, free of charge, all contributions the different States and Territories may see fit to make. These are expected to embrace specimens of minerals, vegetable products, manufactures, works of art; the laws, statistics and rates of taxation of the different States; maps, charts and full descriptions of lands for sale, together with an abstract of titles, and specimens of all kinds that will represent the resources of each State and Territory, so as to enable the Manager of the bureau to answer any question emigrants may want to ask. Everything contributed will be thoroughly exhibited, free of charge, and without partiality or favoritism.

The object of this bureau is to foster and encourage immigration in all the States and Territories that desire it. Hence they should all be represented. Specimens of their resources should be on exhibition for the enlightenment of emigrants who are selecting new homes.

Every route by sea and by land, to and from all the States, individually and collectively, will here be presented to view as fast as received, and the rates of fare and other particulars given when required.

Parties having inducements to offer immigrants, should be full and explicit in their descriptions, so as to be readily comprehended. Those who have lands to offer cannot be too particular in giving locations, descriptions, titles, prices, character of soil, &c.

The authorities in all the States and Territories will readily see the importance of being represented in this Bureau, and of placing on exhibition specimens of their resources. There is abundant room for all exhibits, and all will be shown to the best advantage. Newspapers and periodicals, when received, are carefully filed for inspection.

**BULLION SHIPMENTS.**—Since our last issue shipments of bullion from prominent mines have been as follows: Modoc Con. July 10th, \$4,340, total to date, \$16,638; Grand Prize, 11th, \$3,100; Raymond & Ely, 9th, \$13,332; California, 12th, \$193,353.91; total to date, \$259,740; Con. Virginia, 12th, \$313,850.03; total for June, \$1,394,678.03; Northern Belle, 10th, \$6,303.34; Tybo Con., 10th, \$4,005.03; Tybo Con., 12th, \$4,230; Northern Belle, 12th, \$6,264; California, 14th, \$119,600; total to date, \$379,340; Con. Virginia, 14th, \$45,389, first shipment for July; Standard, 14th, \$17,363.33; Tybo Con., 14th, \$7,992.32; total this month, \$33,718.88; Leopard, 17th, \$3,700; Ophir, 13th, \$8,865.81; Modoc, 16th, \$3,819, total to date, \$24,550.48; Chollar, 17th, \$5,521.89.

**JOHN H. LICK**, administrator of the estate of James Lick, has been notified that Sarah A. Gibson, Mollie E. Hewett, John H. Sidebottoms and Susan L. Harris claim to be the immediate descendants of Jacob Lick, a brother of James Lick, and as such descendants and heirs-at-law are entitled to a distributive portion of his estate. And further, the administrator is notified to contest the various conveyances of property made by said James Lick for benevolent, public and charitable purposes, on the ground that when he made such conveyances he was of unsound mind.

**ASBESTOS.**—We have received a magnificent specimen of asbestos from the mine of R. R. Craig & Son. The fiber is about a foot and a half long and as soft as silk. It is by far the finest specimen of this mineral we have yet seen.

The Monterey coal mine is being opened and developed thoroughly. There are now about 125 men employed in opening the mine, building walls, etc.

LEAD has fallen in Liverpool to £20 5s to £20 10s per ton for good ordinary brands.

FIVE hundred men have lately joined the Miners' Union in Virginia City.

## Signal Service Meteorological Report.

Week Ending July 17, 1877.

HIGHEST AND LOWEST BAROMETER.							
July 11	July 12	July 13	July 14	July 15	July 16	July 17	
29.89	29.93	29.96	29.84	29.79	29.98	30.83	
29.83	29.88	29.89	29.73	29.75	29.82	30.00	
MINIMUM AND MAXIMUM THERMOMETER.							
73	76	75	63	63	71	68	
53	57	59	59	57	62	58	
MEAN DAILY HUMIDITY.							
63	64	71	76	75	74	69	
PREVAILING WIND.							
SW	SW	SW	SW	SW	SW	W	
WIND—MILES TRAVELED.							
252	220	203	247	331	205	255	
STATE OF WEATHER.							
Clear.	Clear.	Clear.	Fair.	Fair.	Rain.	Clear.	
RAINFALL IN TWENTY-FOUR HOURS.							
						0.02	
Total rain during the season, from July 1, 1877, 0.02 in.							

WOODWARD'S GARDENS has the following new attractions: The buffalo chased large whale skeleton; new museum; improvements in the zoological department, besides the other features which have made it popular.

## METALS.

WHOLESALE.)

THURSDAY, M., July 13, 1877.

IRON.—			
American Pig, ton.	23 00	32 00	
Scotch Pig, ton.	22 00	33 00	
White Pig, ton.	25 00	—	
Oregon Pig, ton.	—	—	
Refined Bar.	34 00	64	
Hot Shoes, keg.	5 00	—	
Nail Rod.	—	—	
Norway, Oval.	—	71	
Rolled.	—	—	
COPPER.—			
Copper Tinned.	37 00	40	
Sheathing, lb.	37 00	40	
Sheathing, Yellow.	21 00	224	
Sheathing, Old Yellow.	10 00	11	
Composition Nails.	21 00	—	
Composition Bolts.	24 00	—	
STEEL.—			
English Cast, lb.	14 00	25	
Anderson & Woods, ordinary sizes.	16 00	—	
Drill Cuts.	15 00	—	
Flat Bar.	15 00	18	
Pile Steel.	8 00	124	
TIN PLATES.—			
British C Charcoal.	8 50	9 00	
Bacon Tin.	20 00	—	
Australian.	19 00	20	
ZINC.—			
By the Cask.	11 00	—	
Zinc Sheet 12x14, 7 to 10, lb.	11 00	—	
12x14, 11 to 14.	11 00	—	
8x4 ft., 8 to 10.	12 00	—	
8x4 ft., 11 to 10.	12 00	—	
NAILS.—			
Assorted sizes.	3 00	3 25	
QUICKSILVER.—			
By the lb.	43 00	—	

## LEATHER.

[WHOLESALE.]

WEDNESDAY M., July 17, 1877.

Sole Leather, heavy, lb.	25 00	29
3 1/2 Kil. do.	25 00	24
Jodok, 8 Kil. do.	43 00	650 00
11 to 13 Kil.	68 00	679 00
14 to 19 Kil.	82 00	694 00
Second Choice, 11 to 16 Kil.	67 00	674 00
Cornell, 12 to 16 Kil.	57 00	667 00
Females, 12 to 13 Kil.	65 00	667 00
14 to 16 Kil.	71 00	678 50
Simon Ulmo, Females, 12 to 13 Kil.	53 00	662 00
14 to 15 Kil.	66 00	670 00
16 to 17 Kil.	70 00	674 00
Simon, 18 Kil.	61 00	663 00
20 Kil.	65 00	667 00
24 Kil.	72 00	674 00
Robert Oak, 7 and 9 Kil.	35 00	640 00
Kips, French, lb.	1 00	35
Cal. doz.	40 00	660 00
French Sheep, all colors.	8 00	615 00
Eastern Cal for Backs, lb.	1 00	1 25
Sheep Rooms for Topping, all colors, doz.	9 00	615 00
For Linings.	5 50	510 50
Cal. Russet Sheep Linings.	1 75	4 50
Boot Legs, French Cal, pair.	4 00	4 00
Good French Cal.	4 00	4 75
Best Jodok Calf.	6 00	5 25
Leather, Harness, lb.	35 00	38
Fair Bridle, doz.	43 00	672 00
Shirting, lb.	33 00	37
Well, doz.	30 00	660 00
Buff, ft.	15 00	20
Wax Side.	17 00	18

## Gold, Legal Tenders, Exchange, Etc.

[Corrected Weekly by SUTRO & Co.]

SAN FRANCISCO, July 11, 3 P. M.

LEGAL TENDERS IN S. F., 11 A. M., 95¢. SILVER, 54¢. GOLD, 100¢. GOLD BARS, 880@890. SILVER BARS, 100@105 per cent. discount. EXCHANGE on New York, 50@55-100 per cent. premium for gold on London bankers, 84; Commercial, 49; Paris, five francs \$ dollar; Mexican dollars, 24¢95. LONDON CONSOLS, 94; Bonds, 107. QUICKSILVER IN S. F., by the flask, 9 lb, 42@42 1/2.

"More than Pleased."

OCEOLA MINE, NEVADA CO., CAL., April 19th, 1877. MESSRS. DEWEY & Co.—Gentlemen:—We are more than pleased with your professional ability in the management of our application, and will always recommend your competency as Patent Attorneys, and your honorable and gentlemanly dealings with clients. Truly and respectfully yours, LOUIE R. TULLOCH. THOMAS D. TULLOCH.

## 202 Sansome Street.

DEWEY & Co.'s PATENT OFFICES, MINING AND SCIENTIFIC PRESS AND PACIFIC RURAL PRESS newspaper offices, and the SCIENTIFIC PRESS ENGRAVING establishment will be found at the above place, (No. 202 Sansome Street, N. E. Corner of Pine, opposite the Pacific Bank), after July 21st, 1877. Just three-fourths of a block south of our old location.

## MINERALOGY AND ASSAYING.

1. Bodemann on Assaying—Lead, Silver, Gold, etc., 12mo. \$2.50
2. Brush—Manual of Determinative Mineralogy, 1 vol. 8vo., 2d Edition. 3.00
3. Dana—Descriptive Mineralogy, 900 pages, 8vo., 5th Ed. 10.00
4. Dana—Text-book of Mineralogy and Crystallography, new work, 800 wood cuts and colored plate. 5.00
5. Kert's Metallurgy—Gold, Silver, Lead, Copper, Zinc, etc., 3 vols., 8vo., separately. 10.00
6. Mitchell's Assaying—by Wm. Crookall, 8vo., 10.00
7. Rickett's Assaying Laboratory Processes (new). 2.50

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JOHN WILEY & SONS, 15 Astor Place, N. Y.

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Ridiculous ideas are entertained about purgatives. It is dangerous to scourge the stomach, to rasp the bowels, to prostrate the nervous system with furious evacuations. Nature has given a sample, in the famous Seltzer Spring, of what the bilious, constipated, or dyspeptic system needs for its relief, and so.

Tarrant's Effervescent Seltzer Aperient Science has improved on nature by combining all the valuable ingredients of the German Fountain in a portable form, and uniting those which have no medicinal virtues. This agreeable and potent saline alterative changes the condition of the blood and purifies all the fluids of the body. Sold by all druggists.

## W. T. GARRATT'S BRASS and BELL FOUNDRY SAN FRANCISCO.

MANUFACTURER AND IMPORTER OF  
Church and Steamboat BELLS and GONGS,  
BRASS CASTINGS of all kinds,  
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FIRE HYDRANTS,  
DOCK HYDRANTS,  
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HYDRAULIC PIPES AND NOZZLES,  
For Mining Purposes.  
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AT LOWEST RATES.



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Author of the Explorers', Miners' & Metallurgists' Companion  
672 pages, 63 Illustrations (Second Edition). Price, \$10.50  
The Prospector's Patent "Wes. P. T." Assayer..... 100.00  
The Testing machine for Gold, Silver, Lead, Etc..... 40.00  
CHARGES FOR ASSAYING.—Gold and Silver, \$3;  
Gold and Silver with Lead or Copper, 5; Copper, Iron, Lead  
or Antimony, \$3; and all other metals, \$5 each.  
Qualitative or Quantitative Analysis of Ores, \$10 or \$25;  
Copper, \$10 or \$20; Water, \$25 or \$75; Soils, \$25 or \$50.  
Minerals tested at \$2 per Metal.

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As a conqueror of Rheumatism, Gout, Neuralgia, and  
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Balsam, stands unequalled, as proven by over 300,000 great  
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compound of Sarsaparilla, Dock, Quinaquina, etc., and a  
permanent cure. Sold by all druggists and country gro-  
cers. Take nothing else, and if they haven't it we will  
send by express, boxed, everywhere, at \$1 and \$1.25 per  
bottle; \$5 and \$6.50 half doz. HYATT & HYATT, 240 Grand  
Street, New York.

## MINING CLAIMS IN MONTANA.

Some good mining claims near Sheridan, Montana  
Territory, can be purchased at present on very favorable  
terms. Positive information can be obtained by address-  
ing  
D. B. NOBLE,  
Sheridan, M. T.

## Dewey & Co. { 224 Sansome St. } Patent Ag'ts.

## Mining and Other Companies.

Persons interested in incorporated shares  
will do well to recommend the publication  
of the official notices of their companies  
in this paper, as the cheapest appropriate  
medium for the same.

### Bella Union Quicksilver Mining Com- pany.—Location of principal place of business, San Fran- cisco, California. Location of works, Napa County, Cal- ifornia.

Notice is hereby given that at a meeting of the Board of  
Directors, held on the twenty-eighth day of June, 1877, an as-  
sessment, (No. 2), of ten cents per share was levied upon the  
capital stock of the corporation, payable immediately in U. S.  
gold coin, to the Secretary, at the office of the company,  
No. 312 Montgomery Street, San Francisco, Cal.

Any stock upon which this assessment shall remain unpaid  
on the third day of July, 1877, will be delinquent, and ad-  
vertised for sale at public auction, and unless payment is  
made before, will be sold on Saturday, the twenty-fifth day  
of August, 1877, to pay the delinquent assessment, together  
with costs of advertising and expenses of sale. By order of  
the Board of Directors, ABRAHAM HALSEY, Sec'y.

### California Fruit Growing Associat-on.—

Principal place of business, San Francisco. Location of  
property, El Dorado county, Cal.

Notice is hereby given, that at a meeting of the Board of  
Directors, held on the second day of July, 1877, an as-  
sessment of \$1.50 per share was levied upon the capital stock  
of the corporation, payable immediately in U. S. gold coin, to  
the Secretary, at 331 Sansome Street, S. F.

Any stock upon which this assessment shall remain unpaid  
on the fourth day of July, 1877, will be delinquent, and ad-  
vertised for sale at public auction, and unless payment is  
made before, will be sold on Monday, the twentieth day of  
August, 1877, to pay the delinquent assessment, together  
with costs of advertising and expenses of sale.

Office, 331 Sansome Street.

### Consolidated Bonanza Gold and Silver

Mining Company.—Location of principal place of busi-  
ness, San Francisco, California. Location of works, in  
El Dorado and Washoe Valley Mining District, Ormsby  
County, Nevada.

Notice.—There is delinquent upon the following de-  
scribed stock, on account of assessment No. 1, levied on  
the fourth day of June, 1877, the several amounts set  
opposite the names of the respective shareholders as follows:

Names.	No. Certificate.	No. Shares.	Amount.
Hobbs, C. S.	1	100	10 00
Hobbs, J. K. C.	2	50	5 00
Carpenter, D. A.	5	50	5 00
Hobbs, C. S., Trustee.	6	5000	500 00
Hobbs, C. S., Trustee.	8	250	25 00
Hobbs, C. S., Trustee.	10	20	2 00
Hobbs, C. S., Trustee.	11	5	50
Hobbs, C. S., Trustee.	12	20	2 00
Hobbs, C. S., Trustee.	15	100	10 00
Hobbs, C. S., Trustee.	18	1000	100 00
Hobbs, C. S., Trustee.	10	100	10 00
Hobbs, C. S., Trustee.	20	300	30 00
Hobbs, C. S., Trustee.	21	200	20 00
Hobbs, C. S., Trustee.	22	1000	100 00
Hobbs, C. S., Trustee.	23	9250	925 00
Hobbs, C. S., Trustee.	24	25	2 50
Hobbs, C. S., Trustee.	27	25	2 50
Hobbs, C. S., Trustee.	28	250	25 00
Hobbs, C. S., Trustee.	30	50	5 00
Hobbs, C. S., Trustee.	31	200	20 00
Huber, Joseph.	34	55	5 50

And in accordance with law and an order of the Board  
of Trustees, made on the fourth day of June, 1877, so many  
shares of each parcel of such stock as may be necessary  
will be sold at public auction, at the office of the company,  
No. 10 First Street, San Francisco, California, on Tuesday,  
the thirty-first day of July, 1877, at the hour of 3 o'clock  
p. m., of said day, to pay said delinquent assessment  
thereon, together with costs of advertising and expenses  
of sale.

Office, No. 10 First Street, San Francisco, Cal.

### Excelsior Silver Mining Company.—Loca- tion of principal place of business, San Francisco, Califor- nia. Location of works, Potosi District, Lincoln County, Nevada.

Notice is hereby given that at a meeting of the Board of  
Directors, held on the tenth day of July, 1877, an as-  
sessment of ten cents per share was levied upon the cap-  
ital stock of the corporation, payable immediately in U. S.  
gold and silver coin, to the Secretary, at the office of the  
company, 306 Post Street.

Any stock upon which this assessment shall remain unpaid  
on the tenth day of August, 1877, will be delinquent  
and advertised for sale at public auction, and unless payment  
is made before, will be sold on Monday, the twenty-seventh  
day of August, 1877, to pay the delinquent assessment, to-  
gether with costs of advertising and expenses of sale.

Office, 306 Post Street, San Francisco.

### Mariposa Land and Mining Company of California.—Location of principal place of business, San Fran- cisco, California. Location of works, Mariposa County, California.

Notice.—There is delinquent upon the following de-  
scribed stock, on account of assessment No. 11, levied on  
the sixth day of June, 1877, the several amounts set  
opposite the names of the respective shareholders, as follows:

posit the names of the respective share-holders, a			
Names.	No. Certificate.	No. Shares.	Amount.
COMMON STOCK.			
Adams, Thomas.....	1104	100	\$100 00
Adams, Thomas.....	A 3	50	50 00
Ambleman, Edgar M.....	1406	100	100 00
Ambleman, Edgar M.....	1528	100	100 00
Ambleman, Edgar M.....	1602	100	100 00
Ambleman, Edgar M.....	1634	100	100 00
Ambleman, Edgar M.....	1035	100	100 00
Ambleman, Edgar M.....	1036	100	100 00
Ambleman, Edgar M.....	1037	100	100 00
Ambleman, Edgar M.....	1638	100	100 00
Brumagin, J. H.....	1117	100	100 00
Brumagin, J. H.....	1118	100	100 00
Brumagin, J. H.....	1119	100	100 00
Brumagin, J. H.....	1351	100	100 00
Brumagin, J. H.....	1354	100	100 00
Brumagin, J. H.....	1366	100	100 00
Brumagin, J. H.....	1382	100	100 00
Brumagin, J. H.....	1383	100	100 00
Brumagin, Fred P.....	1030	100	100 00
Brumagin, Fred P.....	1043	100	100 00
Birmingham, D. Walton.....	1473	100	100 00
Bernerheimer, Land S.....	100	100	100 00
Boody & Co., D. A.....	A 24	50	50 00
Boody & Co., D. A.....	A 25	50	50 00
Boody & Co., D. A.....	1650	100	100 00
Brown, D.....	1240	100	100 00
Collins, C. A.....	1197	100	100 00
Collins, C. A.....	1108	100	100 00
Connor, W. P.....	1368	100	100 00
Cowles, Joseph N.....	A 22	25	25 00
Cowles, Joseph N.....	A 25	25	25 00
English, William.....	477	100	100 00
English, William.....	478	100	100 00
Elston, W. A.....	1585	100	100 00
Elston, W. A.....	1586	100	100 00
Elston, W. A.....	1587	100	100 00
Elston, W. A.....	1588	100	100 00
Elston, W. A.....	1589	100	100 00
Elston, W. A.....	1590	100	100 00
Franklin, Ben.....	17	50	50 00
Glendenning, Davis & Amory.....	21	100	100 00
Homans, E. C.....	1410	100	100 00
Harriott & Noyes.....	1103	100	100 00



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### Every Variety of Shafting,

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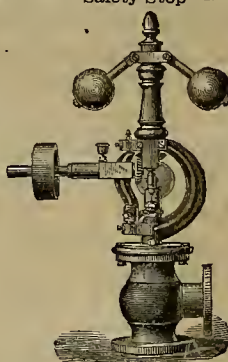
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Salt—1,600 lbs at 25 cents.....	40 00

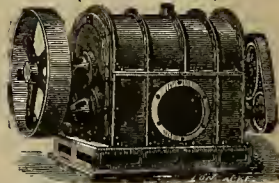
Cost of 20 tons.....\$52 25  
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In a furnace of three or four times this capacity the cost is decreased by 20 per cent.

The furnace is now working successfully at the Poe Consolidated Co.'s mines, in Peavine District, Nev., and at the Eschequer mill, Alpine Co., Cal. For further information, apply to

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Its use in mines brings about

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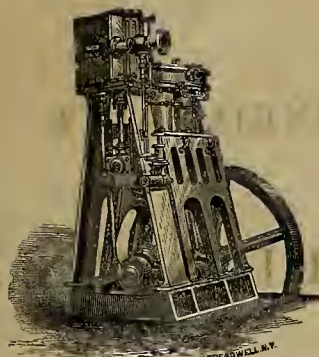
NEVADA CITY, June 10, 1877.  
MESSRS. DEWEY & Co.,—Gentlemen:—My letters patent for improvement in horseshoe bars is received. I thank you for the promptness in which you have attended to this case. Whenever I have any business, in connection with your office, I will be pleased to call on you, and recommend my friends to do the same. Yours respectfully,  
A. BARTON.

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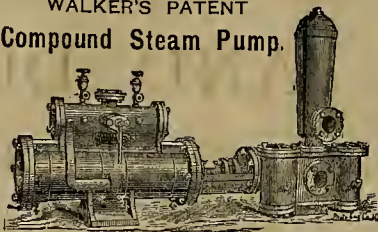
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ECONOMY IN COST.  
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WALKER'S PATENT  
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POSITIVELY UNEQUALED FOR  
SIMPLICITY AND DURABILITY.

Air Compressors, }  
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Plunger Steam Pumps—Cope & Maxwell's.

BUCKET PLUNGER PUMPS—WRIGHT'S.

Centrifugal Pumps—Heald & Sisco's.

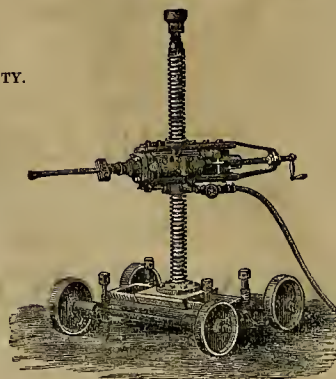
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All Kinds of Mining Machinery, Mine Locomotives, Diamond Drills, Stamp Mills and Furnaces of All Kinds,

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## TWELFTH INDUSTRIAL EXHIBITION,

UNDER THE AUSPICES OF THE

**MECHANICS' INSTITUTE, SAN FRANCISCO, AUGUST 7th, 1877.**

The Board of Managers have the honor to announce that the TWELFTH EXHIBITION will be opened to the public on TUESDAY, AUGUST 7th, 1877, and continue open for at least 30 days thereafter. The Exhibition will be held in

### THE GRAND PAVILION,

Market, Eighth and Mission Streets, and easily accessible by six lines of City cars.

### THE EXHIBITION BUILDING---EXOTIC GARDEN---MECHANICAL ANNEX.

The BUILDING is 200 feet wide, 550 feet long, and 100 feet high, with a gallery around the inside 50 feet wide, beside a promenade 16 feet wide and 1,000 feet in length, from which an unobstructed view of the interior is obtained.

In addition to the above space there will be an EXOTIC GARDEN, 70 by 220 feet, for the display of the Fruits and Flowers of this Coast. Also, A MECHANICAL ANNEX, 200 by 50 feet, for the display of special Machinery.

A large and powerful engine will furnish the motive power for all machinery required to be in motion, while steam and water will be supplied in ample quantities to such machines or appliances as require them. The main line of shafting is 500 feet in length, with sufficient pulleys for all requirements.

### THE ART GALLERY

Is 400 feet in length and 50 feet wide, well lighted by skylights during the day and at night by the most improved reflectors. It will be made specially attractive, both in Pictures and Statuary. Many noted works of art are already promised, and it is confidently expected this department will excel anything ever before seen on this coast.

Over 6,000 gas lights will be used to illuminate the building during the evening. Four thousand seats will be provided for visitors. Also, a first-class restaurant, where refreshments of all kinds can be obtained at moderate prices.



### A GRAND INSTRUMENTAL CONCERT

Will be given each afternoon and evening by an orchestra composed of the best musical talent on this coast, and under the leadership of an experienced and popular conductor.

### PREMIUMS.

In accordance with the general request of exhibitors, the management have decided to offer liberal premiums at this Exhibition, consisting of medals and cash, all to be for the first degree of merit only. The medals will be of a new design, three and one-half inches in diameter, and similar to those awarded at the late Centennial exhibition.

A carefully prepared classified list of premiums will shortly be published.

Articles may be entered for competition or for exhibition only; if for the former they must be so designated when placed in position.

It is important that all parties intending to contribute to this Exhibition should give early notice of the amount and kind of space required.

A copy of the premium list, blank applications for space, rules and regulations, and any information regarding the Exhibition will promptly be given or sent by addressing the Secretary of the Twelfth Industrial Exhibition, San Francisco, Cal.

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# MINING AND SCIENTIFIC PRESS.

An Illustrated Journal of Mining, Popular Science and General News.

BY DEWEY & CO.,  
Patent Solicitors.

SAN FRANCISCO, SATURDAY, JULY 28, 1877.

VOLUME XXXV.  
Number 4.

## Notices of Recent Patents.

Among the patents recently obtained through Dewey & Co.'s SCIENTIFIC PRESS American and Foreign Patent Agency, the following are worthy of mention:

**COAL ELEVATOR.**—John A. Woodward, S. F. This invention relates to an improved machine for unloading cargoes of coal and other similar substances from the holds of ships and at the same time screening the coal and delivering it into carts upon the wharf. The machine is constructed upon the elevator plan and is made in two parts, each of which is portable, so that the machine can be easily moved from place to place and adjusted to the location and peculiar surroundings of the vessel. One of these parts is supported on the vessel which is to be unloaded, and consists of the frame work around which the endless chain travels, while the other part supported upon the wharf consists of the reservoir or hopper into which the screened coal is dumped by the elevator buckets and from which it is delivered into the carts. The operation of the machine is as follows: The upright frame is lowered down the hatchway of the vessel by means of a shaft, pinions, and rack until a semi-circular box or trough rests upon the coal in the ship's hold, where it is held by a ratchet and pawl. Power is then applied to the driving shaft and the endless belt with its buckets is set in motion. The coal is shoveled into the box or trough, from which it is taken by the buckets and carried up over the frame and cast upon the screen. The screenings or fine coal pass through the perforations in the plate and are directed by an apron or chute over the side of the box upon the wharf, while the merchantable pieces of coal fall into a box or reservoir provided for them.

**AQUARIUM.**—Mathew Palen and Daniel Sexton, San Bernardino. This invention consists in constructing aquariums in such a manner that a portion of the water can be raised into a chamber which extends above the level of the water in the main tank and sustained there by atmospheric pressure so that the fish in the aquarium can pass from the main tank into this elevated chamber and back again at will. This invention can be applied in a variety of ways, so as to produce mysterious and illusory effects.

## The Mechanics' Institute Fair.

Arrangements are being perfected in all the departments of the Mechanics' Institute Exhibition. Workmen are overhauling the building and goods are coming in rapidly. Unusual demands for space have been made. To relieve the pressure an addition of 100x100 feet will be made on the east side of the Market street end of the structure. Workmen are now engaged in taking the seats out of the pavilion and otherwise preparing it for the reception of goods. The garden will be adorned with new features, principally in the matter of rockeries and a waterfall. An addition will be made to the large fountain in the center of the main building, and in the tank or basin thus added will float working models of monitors and other vessels of war. These will be from Mare Island. The exhibits from the Eastern States will be much larger than usual, and will include several that attracted attention at the Centennial.

Ira H. Chapman, for many years an engineer of the fire department, has been appointed Superintendent of the engine department.

Superintendent Gilmore is at the pavilion locating the different exhibits. The large painting for the south end of the garden has been completed and is spoken of as very handsome. Altogether the prospect is good for a much better exhibition than ever before.

An advance edition of the MECHANICS' FAIR DAILY, to be published by Dewey & Co. during the fair, will be issued next week.

The latest war news is to the effect that England is becoming very restive on account of Russian success, and intervention is threatened.

## Diagonal Planing and Polishing Machine.

In establishments where cottage and chamber furniture is made there are several kinds of planing required. First, common surfacing or thickening of lumber for inside work. Second, smooth planing of panels, and other outside surfaces. Third, smoothing of door and similar frame work parts, after they are made up.

In carpenters' and joiners' shops the same classes of work have to be done; so, also, in

planing, tooth planing, scraping and sand-papering, in the cases referred to, and produces the best quality of surface for about the same amount as common machine surfacing costs. Several months of successful use in the best walnut furniture factories in New York City, has decided that it is perfect for the uses for which it is intended.

A glance at the cuts will show that in its entirety, it is a diagonal planing and polishing machine, the component parts of which are, a Woodworth planer of ordinary type, with the cylinder so constructed that its position may be

ultaneously with the polisher; in this case, stuff enters with rough, uneven surfaces, to emerge planed and polished ready for oil, filling, varnish or paint.

For planing and polishing wide walnut and other hard wood boards, a reciprocating polisher, or cylinder polisher, is used after it passes the disk. (It is not shown in these cuts). In ordinary doors and frame work the disk works with the grain. The cost of common surfacing is the same as with ordinary planers, that of smooth planing panels and frame work and planing and polishing, from fifty to one hundred per cent. greater.

The machine is the invention of Mr. Wm. R. Norris, of Fort Ann, N. Y., well known for several years past as the introducer and manufacturer of the diagonal planer and diagonal planing and polishing machines, to be found in nearly all the important door, sash and blind factories of the East. What the latter machines do for door, sash and blind manufacturers the new machine is surpassing in the case of furniture factories and the other trades mentioned. Further information can be obtained by addressing the inventor and manufacturer, as above.

## Items of Interest from the Mines.

We give below items of interest from prominent mines, most of which are collated from letters of the respective Superintendents on file at the offices in this city:

In the Overman the drift which was being run north on the 1400-foot level was extended 21 feet, at which point a connection was made with the Belcher south drift on the 1600-foot level. The current of air is very strong, but hot; temperature, 105°.

The Crown Point company are cleaning out some of the old drifts on the 160 and 300-foot levels, but have not yet reached the point at which it is believed considerable ore may be found. They have rented the company's mill, the Rhode Island, to Mackay & Fair, at \$1,500 per month.

The north drift of the Andes is still turning out some low grade ore, but not enough to keep the mill running, so it was compelled to shut down for the present.

North drift 1600-foot level of the Mexican shows a decided improvement, being all in nice vein matter, with stringers of quartz coming in.

The Superintendent of the New Coso says: There has been marked improvement in the quality and width of ledge in stopes. Since I wrote last I am taking out ore superior to any yet extracted, with every prospect of continuance. The north drift from foot of winze is now in good pay ore, and the quality is improving.

They have had to put a blower in the Panther mine, as the air has been quite bad.

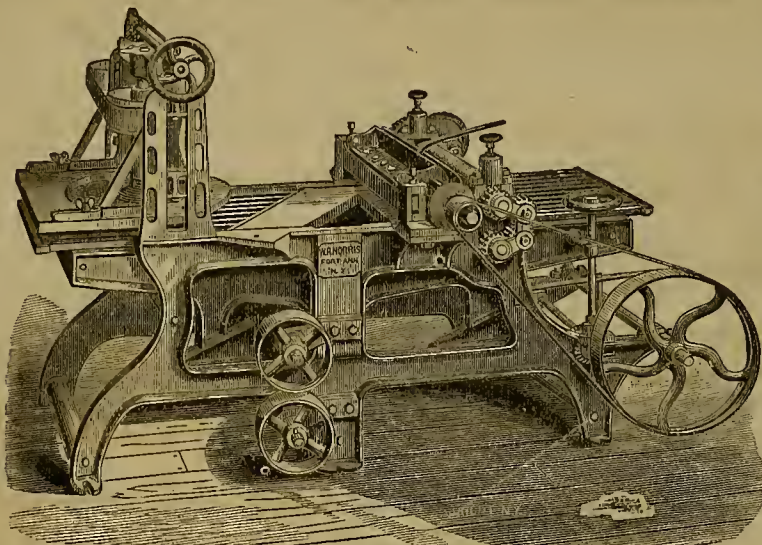
Men have been compelled to stop sinking main shaft at the Tybo Con. mine and timber the same, the ground growing very hocky and soft and dangerous, and they thought it better and cheaper to timber to the 7th level at once than to partly timber it.

The Chollar-Potosi turned out last week 521 tons of ore, assaying \$22 per ton.

An improvement has taken place in the face of south lateral drift 1000-foot level of the Justice; the width of the vein which produces the ore is three feet; the whole vein has a more lively aspect. The upraise and stopes from each end continue to develop a body of fair milling ore.

The Ophir is hoisting and shipping the usual amount of ore to the Winfield mill.

The Eureka Consolidated letter is as follows: The mine shows decided improvement at all points at which work is being done; the fifth and sixth levels showing great improvement during the past week. The third level is still in hard limestone, but with good indications for ore in face of drift. Connections have been made from 70 feet above the fifth level to 100 feet below the ninth level, a distance of 580 feet, all the way in ore of about the same grade as that smelted during the last six weeks. The furnaces have been running well, having produced 328,379 pounds of hullion from 759 tons of ore during the past week. Everything working well at mines and furnaces.

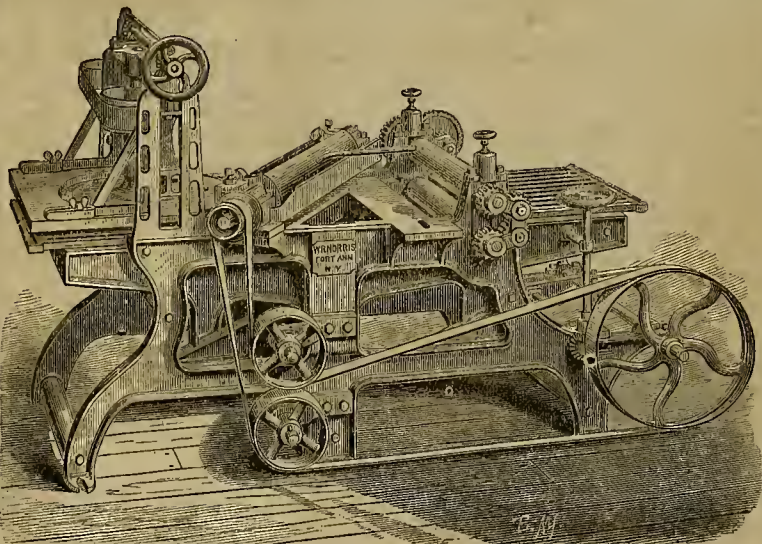


NORRIS DIAGONAL PLANER FOR HEAVY SURFACING.

the manufacture of cabinet organs; in building railroad and street passenger cars; the inside finish of vessels; some agricultural implements; wagons and a large list of other articles.

The common planing is usually done with ordinary planing machines; the smooth planing with panel planers and hand planes; the smoothing of doors and frames with hand

changed at will, from its usual one of square across, to diagonally, or vice versa; and a revolving disk sand-paper polishing machine, all constructed so as to be worked separately or conjointly, as necessity requires. It has various rates of feed adapted to the different kinds of work it does, i. e., heavy fast surfacing, smooth planing, planing and polishing, or planing alone.



NORRIS DIAGONAL PLANER FOR FINISHING AND POLISHING.

planes, tooth planes, scrapers and sand-paper.

The two latter methods involve hard labor, skill, time, and consequently great expense, proportioned to the nicety of the surface obtained, but in all cases great, even when the work is poorly done.

We illustrate herewith a new machine which, while it is one of the best standard surfacers, also does away with the necessity for hand

For surfacing of rough lumber the cylinder is used square across, the polisher disconnected, and the machine used exactly like ordinary planers.

For smooth planing and planing of framed articles, the cylinder is used diagonally, with the appropriate rate of feed.

For planing or polishing of lumber or frame work, the cylinder is used diagonally and sim-



## The Metric System.

[By HENRY G. HANKS.]

The metric system has been accepted by scientific men of all nations, and especially by the chemists. The English are conservative, and long after American chemists and those of other countries had laid aside all other weights and measures in their laboratory operations, the English still clung to the old system; yet, seeing the advantage of decimal divisions, they divided the imperial gallon of seventy thousand grains into decimals, and accepted the grain as the unit of a set of decimal weights, doing this rather than to set aside their prejudices and introduce the French system; but of late years their scientific men as strongly advocate the metric system as their neighbors.

Some system of weights and measures must have been one of the earliest inventions of man advancing in civilization. No sooner did he begin to exchange with his fellow man, than the necessity of some means of measuring quantities began to be felt.

At first common and easily obtained objects were selected as standards, such as "the stone," "the yard," "the foot," "the finger's length," the hand's breadth and at the present day the height of horses is estimated by the number of "hands" required to measure the space.

It is more natural to divide and subdivide the unit of measure or of weight into halves, quarters, eighths and sixteenths, and for this reason the pound was divided into 16 ounces and the foot into 12 inches. It is only men of education who can be induced to use the decimal system.

The idea of making a standard of weights and measures perfect in itself and upon which both weights and measures should be based, is as ancient as history. Philosophers and thoughtful men of every age have seen the advantage of such a standard, but have not agreed as to its character.

An attempt was made to standardize the inch by laying three barleycorns in a line, as we were taught in our early lessons in arithmetic. Such a standard may have satisfied the age in which it originated, but it would hardly meet the views of the present. No person can realize, if they have not given the subject careful study, how difficult it is to find a perfect standard. Let a standard be defined as a space between two points which is unchangeable, and which if lost or destroyed can be reproduced with mathematical accuracy. Take for an example a rod of brass, wood, gold, platinum or any other metal or alloy. Let it be as perfect as the best mechanic can make it. Let it be placed in an engine lathe and the ends perfectly squared by machinery. Assume, also, that a long micrometer screw, with an exceedingly fine thread, moves a needle point which under a microscope marks the end. Imagine on the end of the screw a wheel with ten faces, by means of which the needle point may be placed in any desired position by counting the revolutions of the decimal wheel. Here would seem to be a perfect means of ascertaining the exact length of the standard, and it would also seem that another rod of equal length might be made, but it is not so. In the first place, the rod itself does not remain of the same length. Each change of temperature either lengthens or contracts it, and moreover, the micrometer screw changes also, but as it is not the same metal, the change is not the same. To correct this error, let us always measure the rod in a room of the same temperature. By this device we shall partially succeed, but not wholly, as it is impossible to keep the temperature of a room the same.

Let another example be a pendulum which vibrates once in a second of time. The same difficulty of maintaining the length of the metallic rod of the pendulum arises as in the first example, besides which there are other sources of error, as the state of the barometer, the altitude above the sea-level, and even the difference of latitude and longitude, which errors can scarcely be overcome.

These examples are given to show the difficulty of reaching perfection. Others might be stated, but it will be unnecessary. In seeking this perfection, so much to be desired, the nature of all the metals and alloys has been carefully studied, and the full force of mathematics called into requisition, as will be shown.

It may be thought that such absolute accuracy is unnecessary, but when it is remembered that the standard must be divided and multiplied almost without limit, and that the smallest error becomes enormous in calculating such distances as the diameter of the earth's orbit, it may be understood why scientific men have expended so much time and expense in the search for a perfect standard.

The present unit of measure accepted as the standard, both by England and the United States, is the *yard*. It is said to have originated with King Henry I of England, who ordered a measure to be made which should be the exact length of his arm. The old standard, known as the "ulna," or ancient "ell," had been long in use. This measure had been the length of some other person's arm who is unknown.

This standard has been retained since, and is the identical yard now in use in the United States. By special act of Parliament, in June, 1824, it was made the standard of linear meas-

ure in Great Britain. It was to be reproduced, if lost, by computing the length of a pendulum vibrating seconds in the latitude of London, in a vacuum and at the level of the sea. The standard yard is described in the Parliamentary enactment as the distance between two points in the gold studs on the straight brass bar in the custody of the Clerk of the House of Commons, whereon the words "Standard Yard, 1760," are engraved, said brass rod being maintained at a temperature of 62° F., and it is to be known as the "imperial yard."

The act provides also that one-third of the standard yard shall be a standard foot, and the twelfth of a foot the standard inch; that the pole or perch shall be five and one-half such yards, the furlong 220 such yards and the mile 1,760 such yards.

In 1834 a fire destroyed the Parliament house and with it the standard yard. An attempt was made to restore it by measuring a pendulum, according to act of Parliament on that subject, when it was found that it could not be done with any degree of certainty. A commission was appointed in 1838, which recommended the construction of a new standard yard and four Parliamentary copies from the best authenticated copies that could be obtained. The commission also recommended that the copies should be placed in the custody of officials in different parts of the kingdom. The restored standard was legalized by act of Parliament July 30th, 1855.

The standard of linear measure in the United States is a brass scale 82 inches in length, made for the Coast Survey in 1813 by Fraughton, of London. The temperature, when measured, is 62° Fah. The measure is taken between the 27th and the 63d inches. No Congressional action has ever made it a legal standard.

I believe it is not generally known that the Congress of the United States have passed a law legalizing the French metric system of weights and measures, and I may to-day legally sell you a kilogram of potatoes or a liter of cod liver oil.

The following are the acts bearing on this subject:

*An act to authorize the use of the metric system of weights and measures.*

SEC. 1. Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled, that from and after the passage of this act, it shall be lawful throughout the United States of America to employ the metric system, and no contract or pleading in any court shall be deemed invalid or liable to objection, because the weights or measures expressed or referred to therein, are weights or measures of the metric system.

SEC. 2. And be it further enacted, that the tables in the schedule hereto annexed shall be recognized in the construction of contracts and in all legal proceedings, as establishing in the terms of the weights and measures now in use in the United States, the equivalent of the weights and measures expressed therein in terms of the metric system, and said tables may be lawfully used for computing, determining and expressing in customary weights and measures, the weights and measures of the metric system.

*An act to enable the Secretary of the Treasury to furnish to each State one set of the standard weights and measures of the metric system.*

Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled, that the Secretary of the Treasury be and is hereby authorized and instructed to furnish each State, to be delivered to the governors thereof, one set of the standard weights and measures of the metric system for the use of the States respectively.

*An act to authorize the use in post-offices of weights of the denomination of grams.*

Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled, that the Postmaster General be, and he is hereby, authorized and directed to furnish the post-offices exchanging mails with foreign countries, and to such other officers as he may think expedient, postal balances denominated in grams of the metric system, and until otherwise authorized by law, one-half ounce avoirdupois shall be deemed and shall be taken for postal purposes as the equivalent of 15 grams of the metric weight, and so adopted in progression, and the rates of postage shall be applied accordingly.

The French metric system originated during the revolution. Public attention was first called to the chaotic state of weights and measures in France in the year 1790 by Talleyrand. On the eighth day of May, 1790, the government of France sent a formal proposal to England, asking that nation to appoint a committee of scientific men, members of the Royal Society, to meet the same number of members of the Academy of Sciences of France, to determine the length of a pendulum vibrating seconds, in latitude 45°, at the level of the sea, to form the basis of a mutual standard. The English government failing to respond, the French government appointed the following members of the Academy as commissioners: Borda, Lagrange, Monge, Laplace and Condorcet. These savans proposed for the standard the ten-millionth of a quarter of a meridian of the earth. The name proposed for this standard was the meter. They proposed to have all the multiples and subdivisions divided in decimals.

The commission had under consideration during their sessions three standards: length of a pendulum, one-quarter of the equator, and one-quarter of a meridian.

In their report they advised the measurement

of that portion of the meridian extending from Dunkirk to Barcelona, six and one-half degrees north and three degrees south of the parallel of 45°. By reference to a map of Europe it will be seen that this line extends through France in its longest direction and through a small portion of Spain.

It was also proposed that the weight of a cubic decimeter of water at the melting point of ice should be determined and taken as the standard of weight. The report of this commission was made to a committee of 20 of the most scientific men of the age, nine (9) of whom were French and the others of different nationalities. The report was accepted and immediately carried into execution. DeGambre and Mechain were appointed to measure the arc, and the determination of the weight of water was made by Lefevre-Gineau and Fabbini. The measurement was finished in 1796, after much difficulty on account of the revolution. The meter was found to be 39.3707004 English inches.

It was discovered, while experimenting on the weight of water at different temperatures, that it did not attain its maximum density at zero of the centigrade thermometer, which is melting point of ice, but at six degrees higher on the scale. The commissioners, therefore, determined the weight of a cubic decimeter of water at that temperature, calling the weight a kilogram, thus basing a standard of weight on the tenth of the meter. The quantity of water so determined was called liter, which supplied the unit of a measure of capacity. The standards were legally sanctioned Nov. 2d, 1801.

It would naturally be supposed that when such great care had been taken and so much expense incurred that great accuracy might be expected to result, but, strange to say, such was not the case. In 1838, Puissant, who was engaged in making a map of France, announced the discovery of an error in the calculation of the length of the standard meter, equal to the 1-2,590 of the whole, and that the provisional meter, hastily adopted in 1793, from calculations made by Lacaille, was really more correct than that established by the great commission. Subsequent calculations showed that the error was the mean of two greater errors which had escaped the notice of the commission.

Prof. Miller, of Cambridge, has shown that the weight of a standard kilogram is less than that of a liter of water at its maximum density, having been calculated before the maximum density had been determined with accuracy. After much discussion, it has been decided to adopt the standard meter before mentioned in the archives of Paris, until the errors of former calculations could be corrected. The length of the standard meter is to be taken at the freezing point of water, and the copies to be furnished to foreign nations are to be platinum mixed with iridium. Each meter is to be furnished with a delicate thermometer and all the divisions are to be made by a ruling engine in the most perfect manner.

As far as we are concerned, the metric system is perfect, although the standard is not so. By perfection, I would be understood to mean practical perfection, or if this is a misnomer, I can at least say that the system is better than any other known system, and I doubt if it can be improved.

One of the greatest advantages of the metric system is the facility with which weights and measures can be reproduced and, in case of necessity, can be improvised, as will be shown.

It has been urged as an objection to the introduction of the metric system, that its adoption would render useless all the scales, weights and measures and a great part of the literature now in use. The same may be said of the new system of notation in chemistry. Yet nothing is more certain than that the new will eventually supplant the old. I hardly think that the warmest advocate of the metric system would propose to compel the instantaneous adoption of the new system of weights and measures, but, by showing its advantages, would encourage its gradual introduction. If every photographer would accept this system in his laboratory operations and in his calculations, as the chemists have done, he would be greatly benefited.

The multiples and sub-divisions of the meter are in decimals. The names of the multiples are derived from the Greek numerals, while those of the sub-divisions are of Latin origin.

The measures of length are the meter; the decimeter = 10 meters; the hectometer = 100 meters; the kilometer = 1,000 meters; the myriameter = 10,000 meters; the decimeter = 10th of a meter = 0.10; the centimeter = 100th of a meter = 0.01; the millimeter = 1,000th of a meter = 0.001.

The measures of the surface are: centiare, 1 square meter; are, 100 square meters; hectare, 10,000 square meters.

The measures of capacity are: the liter, 1 cubic decimeter; the decaliter, 10 liters; the hectoliter, 100 liters; the kiloliter, 1,000 liters.

This measure is also called the stère, and is used in France for measuring bulky articles, as for example, fire-wood.

The liter is sub-divided into the deciliter = 1-10th of a liter; the centiliter = 1-100th of a liter; the milliliter = 1-1,000th of a liter.

In practice some of these divisions are set aside, as for instance, in speaking of the sub-divisions of the liter it is customary to say so many cubic centimeters, each of which is the 1-1,000th of a liter. Three centiliters would be written 300 cubic centimeters, or 300 C. C.

In speaking of great quantities it is usual to speak of the number of hectoliters. So also in

using the weights. In usual operations we calculate in grams and milligrams, and in dealing with larger quantities the kilogram and decimals are taken. Any computation made in grams can be stated in kilograms simply by moving the decimal point and vice versa.

In almost all scientific work tables will be found for converting all other weights into the French system. They are easy to understand and simple in application. The best that I know of were calculated to accompany the acts of Congress quoted in the first part of this paper. They may be found in the Smithsonian Report for the year 1865. I would advise all who are specially interested in this subject to obtain this volume for reference. If time would allow I would explain the use of these tables, but I think no person would find any difficulty in applying them after a little study.

## Preparing to Work Flue Dust.

We paid a visit to the Lemmon mill yesterday afternoon and by the courtesy of Mr. Clark, were shown through the institution. The mill was built a number of years ago, for the purpose of reducing the free ores in this vicinity, but for some reason, probably because it failed to pay, has been idle for a long time. Messrs. Clark & Wallace effected a lease of the mill about a month ago, and since that time have been busily engaged in renovating and repairing the machinery, and getting it in order to work the flue dust purchased by them of the Consolidated company. We have given an account of the discovery of the process by Messrs. Clark & Wallace and the wonderful results obtained in experiments at Salt Lake. They concluded that the dust could be worked at this point more profitably, saving, as it would, the items of sacking and freight. The Lemmon mill is a dry crusher, provided with a White roasting furnace, a battery of 15 stamps, pans, concentrators, agitators, etc. Several modifications and improvements have been introduced by the lessees, notably in the battery, the speed of the stamps having been increased from 70 to 90 drops per minute, and the drop reduced from nine to six inches. The stamps will not be used in the working of the flue dust, but it is the intention of the owners to crush any free ores that may be offered to them. A large bin at the rear end of the mill receives the dust and conveys it to the drying floor, where all of the moisture is evaporated. It is then received in a sheet-iron receptacle, where it is mixed with salt and conveyed to a series of belts that carry it to the hopper over the furnace. As above stated, the roaster is of the White pattern, a system that is generally used in Nevada county, California. It would occupy too much space to attempt to give the workings of the furnace; suffice it to say that by the time the charge reaches the delivery floor it is thoroughly roasted and ready for the pan amalgamation. The pans in the mill are of the Horn pattern, and are not adapted to give the best results, but will be used for the present. Their concentrators are also old-fashioned but their defects will be remedied by careful manipulation. Larger pulley blocks have been placed on this part of the shafting, increasing the speed of the millers. The engine has been overhauled and put in good order, and also the retorts. The old swimming bath south of the mill has been repaired and will be used as a source of water supply for the present. The tank on the hill has been caked and the pumps were at work yesterday filling it. Negotiations are pending with Major McCoy, looking to the extension of the main to the mill tank on the hillside. The mill will start up on Monday for a permanent run. Messrs. Clark & Wallace are not given to boasting, but it is easy to see by their actions that they are convinced of the future success of their enterprise—a good fortune that we heartily wish them. The town, as well as the owners, will benefit by the profitable workings of the dust. —*Eureka Sentinel*.

**HUNTER DISTRICT.**—We learn from C. L. Broy, who has just returned from Hunter district, the following facts in regard to that flourishing locality: A number of promising mines are being worked, among the principal of which are the Vulcan and Crown Point, both owned by the Hunter company. At the Vulcan the company have erected hoisting works and the machinery is nearly set. The main shaft has been sunk to a depth of 300 feet. The mine is developing well and some very high grade ore has been met with in the various drifts and levels. There is about 300 tons of ore on the dump awaiting reduction. They have let a contract for a large amount of coal to be used in the company's works. The works will be supplied with water from a large spring, some three miles distant, and will be brought in as soon as the pipe, which is now on the road, arrives. The furnace for the reduction of the company's ore is in course of construction and will be finished and running in six weeks from the present date. The furnaces are situated about a mile from the mine, and the ore will be hauled by teams that distance. The company's affairs are intelligently directed by Ellsworth Daggett, a thoroughly competent Superintendent. Quite a camp has sprung up in the district, some 40 houses having been built, including two stores, one lively stable, three restaurants, six saloons and two lodging houses. Gilmer & Salisbury contemplate establishing a stage route from the town to Toano, the nearest point on the C. P. R. R. The prospects of the district are very flattering. —*Eureka Sentinel*.



## MECHANICAL PROGRESS.

## Returning to Wood for Safety.

It is not a little interesting to note that inventors of impenetrable war vessels are turning their attention from iron back again to the material of the raft, the canoe and the merchantman. We read in an English exchange of the unsinkable vessel of war proposed by Mr. W. M. Pollexfen. The principle of the invention can be very briefly explained; it consists in making the ship as near as practicable a solid mass of timber, the only deviation from solidity being the construction of an impregnable compartment in the center for carrying the armament and machinery. The rectangular bold or space is, of course, arranged to be of suitable size, and Mr. Pollexfen even proposes to provide that the ship shall continue to float although the reserved compartment shall be completely filled with water, and still have buoyancy to spare. He points out that such a ship would be invincible, for though completely swamped and the engine or other rooms flooded for a time, she could be managed with her sails and remain as formidable as any sailing war vessel until her damage was repaired. But this is not all; the whole of the exposed portion of the hull being constructed of solid timbers, Mr. Pollexfen suggests, with much show of plausibility, that not even a torpedo would disable his ship, since the most it would in all probability do is to rend away, without detaching, one or two of the outside timbers, so that no less than a whole succession of torpedo attacks would render the vessel unseaworthy. He remarks that timber can be prepared so as to resist fire to a great extent, and if this preparation were found to interfere with the required weight of the timber in any particular instance, another method can be resorted to—that of rendering the exposed timbers fireproof.

## Progress in Pacific Coast Lumbering.

Year by year, says a writer in the *Post*, the lumber industry of the Pacific coast is growing in larger and larger proportions, and until recently the demand has increased in like proportion. The lumber which is shipped to San Francisco from Puget sound consists in the main of Oregon pine, although there is a good deal of spruce, rough and dressed, some rough cedar and some maple. The redwood comes from California ports. Just at present lumber enters our port from the south, Crescent City, Coos bay, the Columbia river and all along the coast to Victoria. The rapid increase in the lumber trade within the past few years will be seen by the following figures, kindly furnished to the writer by Mr. Earle, of the Lumber Exchange: In 1874 there was received in San Francisco 139,856,486 feet of Oregon pine, 11,866,163 feet of rough spruce, 765,690 feet of dressed spruce, 3,444,343 feet of rough cedar, 188,856 feet of maple and 1,019,646 feet of redwood. In addition there was received some 10,000,000 feet in all of rough sugar pine pickets, railroad ties and telegraph poles, making in all a grand total of 253,250,564 feet. In 1875 we received 163,695,426 feet of Oregon pine, an increase of 23,836,940 feet over the previous year. The increased production in the other kinds of lumber was in nearly the same ratio, and the total increase was equal to 53,073,634 feet. In the year 1876 the total number of feet received reached 309,159,972, equal to 2,835,774 feet over the amount received in 1875. As showing how rapidly lumber is coming into the market, it may be mentioned that last month no less than 31,073,203 feet was received, against 23,610,423 feet in June of last year. The average for the month of June for the past five years has been 22,000,000 to 25,000,000 feet. The July of 1876 was a remarkable month, about 33,000,000 feet having been discharged. The estimate for the present July is about 25,000,000 feet.

## Welding Wire.

In manufacturing guides for coal and other pits, colliery ropes, telegraph wire, telegraph cables and fencing, and in other manufactures, it is often necessary in order to obtain wires of the required length to join two or more lengths of wire together, end to end, and this is ordinarily done by the process of welding. But in welding together wire of iron or steel the metal is frequently so injured during the welding process that the junction formed is very weak, and the wire is liable to break at the welded part. The object of the invention of Mr. W. Hibell, of Birmingham, as described in the *London Mining Journal*, is to produce wires of iron and steel of any required length, having at the joined part a strength equal to any other part. He cuts away a portion of the end of each wire, so as to give it a semi-cylindrical figure, the said cut-away portion extending about one inch from the end of the wire. The extreme ends of the wires may terminate in planes at right angles to the axis of the wire, but he prefers to incline each end so as to give it a wedge shape, the thin end of the wedge terminating in the axis of the wire. When he thus inclines the ends of the wire, he makes the shoulders terminating the cut-away parts of an under-cut figure, so that the wedge-shaped end of one wire when the ends of the two wires are fitted together shall engage with the under-cut shoulder of the other wire. The ends of the wires thus shaped he connects together by the process of brazing or

hard soldering, and the junction formed has a strength equal to that of any other portion of the wire. In wires of small diameter he prefers to give to the ends to be joined an inclined figure simply—that is, he cuts or otherwise forms on each of the ends to be joined a plane, making but a small angle with the plane in which the axis of the wire is situated. The two plane inclined ends are joined by hard soldering or brazing.

## Measuring Cylinders.

Experts in the machine shop, says the *Manufacturer and Builder*, commence to see that the common way of measuring circular cylinders, such as shafts, by means of callipers, is very inaccurate. Different individuals will always find different dimensions, because they judge by the feeling of resistance when the points of the callipers pass over the diameter; and this is the most uncertain of all impressions. The touch may be more accurate than the eye when passing the hand over a level surface to find inequalities escaping the eye, but in case of the use of callipers this sense is not so reliable. The eye is much more so, and therefore it is better to measure cylinders by passing a flattened wire around them (copper is best, as it adapts itself to the curvature better than steel.) Make marks where the two ends overlap, and then measure the distance of the marks to find the circumference, which being more than three times the diameter, will for this reason alone have a chance to be more than three times as correct, even if the more accurate eyeght did not supersede the touch with the callipers.

This of course applies only to large cylinders; for small ones the measuring of the circumference would be very inconvenient and impractical for those of the diameter of an inch or less; then of course a good gauge plate is the thing needed, and universally used, being much more reliable than mere measuring of the diameter.

THE WORLD'S MACHINERY.—The effect of machinery upon the industrial interests of the world generally, is a subject that frequently engages the attention of the economist. In this connection the following estimates of the labor-saving effects of steam motive-power, made by Dr. Engel, the head of the statistical bureau at Berlin, Germany, will be interesting. According to Dr. Engel, as noted by the *Polytechnic Review*, the aggregate steam motive-power at present in use in the world is 3,500,000 horsepower, employed in stationary engines, and 10,000,000 horsepower in locomotive engines, making a total of 13,500,000 horsepower. This force is maintained without the use of animal food, except by the miners who dig the coal and provide the fuel, and the force maintained in the muscles is to the force generated by the product labor as about one to 1,000. This steam-power is equal to the working force of 25,000,000 horses, and one horse consumes three times as much food as one man. The steam-power, therefore, is equivalent to the saving of food for 75,000,000 human beings. Again, three power-looms, attended by one man, produce daily 78 pieces of cotton fabric against four pieces produced by one hand-loom worked by one man in the year 1800. Again, a carpenter's planing machine does the work of 20 men. This, of course, is but the merest outline of what is accomplished by the use of steam-power and labor-saving machinery.

NEW LOCK FOR FREIGHT CARS.—Railways have been not a little troubled by tramps and thieves entering freight cars while attached to trains or while standing on sidings. We read in the *Utica, New York, Observer* that Mr. E. F. Hotchkiss, acting upon a hint of Superintendent Priest, has got up a lock for the freight car which promises to prove very effectual. The lock does not show on the car, because it is under. It cannot be reached when the car is in motion, and when the car is at a standstill in the yard it would be dangerous to go under to unlock it unless with a certainty that the car would not be moved. The lock is operated by a wrench and left-hand screw, which acts as a key and starts an inch bolt of iron which fastens both doors securely. The lock can be easily applied to railroad trains. This lock seems to be a settler on the thieves, inasmuch as it has been their practice to break off the common locks and then enter the car—all this while the car was in motion. This lock they cannot get at. The lock is now on trial on a car running between Utica and Albany. When it first arrived in Albany no directions as to opening it had been received, having miscarried. The freight-house men went to work with a bar and sledge to open it. They succeeded in forcing the door back but five inches, and gave up the task as a bad job.

LOCOMOTIVE FIRE-BOXES.—On the form and proportion of the fire-boxes, the committee of the Master Mechanics' Association recommend no changes excepting to suggest an increase in the number or length of tubes. With the present form of construction of locomotives, any material change in the boiler is impossible, but the question is now being considered by many persons whether some very material changes in the plan of constructing engines are not desirable, in order to get a larger boiler and especially a larger fire-box. When locomotives did not exceed from 20 to 28 tons in weight, the available width between the frames was quite sufficient for the fire-box, but with the rapid increase in size of engines from 30 up to 36 and 38 tons weight, the case is quite different,

## SCIENTIFIC PROGRESS.

## Catastrophism.

Mr. Clarence King is the author of the scientific sensation of the year. For the subject of his address before the alumni of the Sheffield scientific school at New Haven, Conn., he chose "Catastrophism, or the Evolution of Environment." In his geological researches Mr. King has found disturbances which can apparently be accounted for only upon the ground of catastrophe or complete overturning of existing conditions. Thus he brings himself at direct issue with the evolutionists, who put continued, gradual and uniform growth and change at the basis of their theories of development. Mr. King's address was very long. We can but note a few of the points made. He first established the reality of physical disturbances at several epochs in the history of the Cordilleras region, which has been his field of labor. Between the catastrophes intervened the long periods of quiet action, such as is claimed for universal time by the uniformitarians. The same amount of energy would be required to elevate mountainous districts upon either view. The effects of the cataclysms upon life are claimed to be partly extermination; partly destruction of biological equilibrium, thus violating natural selection; and partly the production of morphological changes in plastic species. Marked changes of species are noted in connection with these catastrophes. An illustration is afforded by the supposed genealogy of the American horse, as set forth by Huxley and Marsh, and regarded as demonstration of evolution, or the descent of the several genera from each other. King asserts that in the Cordilleras country, where these relics occur, there has been a catastrophe intervening between each two successive forms of the horse.

After criticizing the opinions of Huxley, Lyell, Hutton, Darwin, and others, he recurred to the effects of sudden terrestrial or cosmical changes, and conceived that the effects of these changes would be, first, extermination; secondly, destruction of the biological equilibrium; and thirdly, rapid morphological change on the part of plastic species. When catastrophic change burst in upon the ages of uniformity, and sounded in the ears of every living thing the words "change or die!" plasticity became the sole principle of salvation. And plasticity is the key to survival and prosperity. Mr. King remarked in conclusion of his address: "He who brought to bear that mysterious energy we call life upon primeval matter bestowed at the same time a power of development by change, arranging that the interaction of energy and matter, which make up environment should, from time to time, burst in upon the current of life and sweep it onward and upward to ever higher and better manifestations. Moments of great catastrophe, thus translated into the language of life, become moments of creation, when out of plastic organisms something newer and nobler is called into being."

A TRULY ARTIFICIAL EYE.—Dr. William Siemens has constructed, by an ingenious adaptation of selenium to the purpose, an artificial eye that is sensitive to light and to difference in color, which gives signs of fatigue when it is submitted to the prolonged action of light, and regains its strength after resting with closed lids, and which by an electro-magnet attachment may be made to close itself involuntarily, as does the human eye, on the occurrence of a vivid flash. In its construction a hollow sphere, suitably supported, is provided with two openings, in one of which is placed a converging lens and in the other a selenium plate, the latter in communication with an electric current and galvanometer. The lens being covered with two movable screens, the whole is comparable to an eye, in which the screens represent the lids and the selenium plate the retina. Whenever the screens are removed the galvanometer is seen to deviate and the degree of deviation depends on the color of the light which converges upon the selenium; it is very slight if the light is blue, more if the light is red and still more if white light is transmitted.

TYNDALL'S SWISS COTTAGE.—The *London World* says: "By next season Professor Tyndall will have built himself a mountain home among his beloved peaks and glaciers. The spot he has selected is in the center of a region of unrivaled beauty and interest. From the Bel Alp, hard by the upper valley of the Rhone, and not far from the spot where the Simplon road bends southwards, he will enjoy on the one side a magnificent view of the Matterhorn, the Weisshorn, and Dom, rearing their proud crests above an army of ice peaks; on the other side is the great Aletsch glacier, bounded and fed by the giants of the Bernese Oberland, the snowy axe-edge of the Jungfrau, the savage pinnacle of the Finsteraarhorn, and the great central dome of the Aletschhorn. It was to the summit of the latter magnificent peaks, springing from enormous glaciers, that Professor Tyndall last summer conducted his bride, to the great delight of that lady, whose skill as a cragswoman is a source of infinite pride to her husband."

SIR WILLIAM THOMSON.—The Italian Society of Sciences has awarded Sir William Thomson, of Glasgow, the Matteucci prize for the investigator who has contributed most to the advancement of science during the past year.

## What Underlies Sacramento.

The boring of an artesian well at Sacramento shows the character of the underlying strata. The *Record-Union* says:

After passing through strata of loose sand, gravel, clay, boulders, etc., the tools at a depth of 886 feet struck soapstone, then passed into cemented sand, and at 1,090 feet struck wood, which was met with at intervals until a depth of 1,108 feet was reached. This wood is black, but in a good state of preservation, looks like pine or redwood, and remains solid after exposure to the air. Soapstone followed the cemented sand, and was in turn followed by cemented sand at a depth of 1,160 feet, and the boring tools have been in that substance ever since. The tubing is full of water to within about 50 feet of the surface of the ground. About the time a depth of 1,075 feet was attained gas commenced bubbling up through the water, and one night when a candle was lowered down to look at the water there was quite a little explosion. Last Sunday the hole in the tubing was covered over at the top, leaving an opening in the center through which a piece of half-inch gas pipe was passed. The gas escaping through this pipe was ignited and blazed up to a height of two feet and a half, burning with a bluish flame, but neither when burning nor otherwise did it emit any odor. Monday forenoon the gas would not ignite, but that afternoon it burned freely again. Wood has been found at several depths besides that mentioned above, the lowest being 1,320 feet, when some of the pieces taken out had a coating of cemented sand, showing that the stick of timber from which it was taken was lying in that species of deposit.

A WONDERFUL MUSEUM.—A great advance, as far as effect is concerned, on existing methods of exhibiting the remains of extinct animals has recently been made in Germany. M. Martin, a distinguished naturalist and taxidermist, has organized, near Stuttgart, a most remarkable museum, in which the various species long since extinct are attempted to be reproduced as they appeared during life. The pieces are models constituted according to fossil skeletons in the most celebrated museums of the civilized world. The collection already contains the gigantic saurians of the trias, the ichthyosaurus, the plesiosaurus, the pterodactyl, the cave bear, the dinomys and many others, all reproduced with great skill. M. Martin has, however, lately completed a work which eclipses his previous efforts, and may be regarded as his *chef d'œuvre*. It represents a mammoth of the quaternary epoch, and is formed according to documents furnished by Pallas, and numerous remains of this fossil elephant are to be found in the rich cabinet of natural history in Stuttgart and other collections. The hair is copied from that of the celebrated mammoth found in Siberia. The height of the object is five meters, its length eight meters. It is hollow inside; four posts pass through its legs. The contour of the body is made with bent laths connected by metallic sheeting. The whole is covered with thick papier mache, on which the hair (made with the fibers of a species of Indian palm) is gummed. This fine object has been bought by Prof. Ward for his museum of comparative anatomy in Rochester, N. Y.

THE PANTHER AS A SEED-DISTRIBUTOR.—An English journal says: The many unlikely methods by which the seeds of plants are diffused over land and sea till they at length find a congenial spot for development, form an interesting and curious study. It is well known that bees carry pollen from flower to flower, and thus act not only as sowers of seed, but also as fertilizers for the female plants. A curious instance of this kind has recently been communicated by a well-known scientific man, who states that attached to the skin of a panther recently shot in India were found numerous seeds, each of which had two hooks, manifestly designated to attach themselves to foreign bodies. As the panther moved about it collected the seeds on the skin and carried them about wherever it went; but when it rubbed against the shrubs, it of necessity brushed some off, and thus distributed them. One of the seeds produced a handsome plant, and beautiful clusters of tubular flowers. It was immediately recognized to be the *Martynia diandra*, a plant which, although introduced into England as far back as 1731, has scarcely ever been cultivated, although it has been commented on by botanists.

NORTH AMERICAN ALGÆ.—We find in the *American Journal of Science* the announcement of the appearance of "Algæ Exsiccatae Americæ Borealis; Curantibus W. G. Farlow, C. L. Anderson, D. C. Eaton, Editæ. Fasciculus I. Boston, 1877." Two editors of the volume are of Harvard and Yale and Dr. Anderson will be recognized as a resident of Santa Cruz and a contributor to the *PRESS*. The specimens of Algæ which are thus presented to the public are fifty in number and Dr. Gray pronounces them "all of real interest and many of them new or next to new, at least in collections." Algæ from California have been unobtainable until the present effort made them available.

THE HISTORY OF THE FLAG.—The July number of the *Magazine of American History* (A. S. Barnes & Co.), has for a leading article a careful and exhaustive sketch of "Our National Flag—its History in a Century," by Major-General Schuyler Hamilton, the first historian of the American flag.











## The Forest Hill Divide as a Mining Section.

We have often spoken of the almost limitless deposits of auriferous gravel lying in Placer county, and particularly of the immense formations of this character lying between the north and middle forks of the American river, known as the Forest Hill divide. This ridge, says the *Placer Herald*, varying in width from two to 10 miles, is, from the region of Todd's valley to above the Secret house, a distance of some 20 miles, underlain, in a comparative sense, with one solid bed of washed gravel, and there is not a shovelful of that gravel scarcely but contains more or less gold. Where this ridge has been cut by modern channels the gravel has been washed out, and it is the gold from these deposits mainly that supplied the river beds which remunerated the miners here so liberally in early days. This alone is evidence that the untouched deposits are rich, but if further evidence were wanting we find it in the developments made by the miners, for in not a single instance that we have heard of has this gravel been struck and the opening fitted up for working by the drift process, or for hydraulic mining where more convenient, but it has yielded fair remuneration for the money and labor expended.

"If this is so," says the stranger, "why don't everybody around there go to mining that gravel and get rich; why don't those running off to the Black Hills and to Arizona come here instead, and why don't those who have been putting their money in Washoe wildcats develop these mines where the investment is more sure and where the outlay would tend to build up our own State?"

These queries very naturally suggest themselves to the stranger's mind, and on a clear answer to the same much depends.

In the first place, therefore, the people residing in this part of the country do not all go to mining these gravel deposits because they have not all got the means. To open and fit up either a hydraulic or a drift claim requires large expenditures before a dollar can be realized, and therefore many who see the opportunity and would fain take hold of the work are deterred from doing so for want of capital. There are cases, to be sure, on this same divide, where poor miners have combined together, and doing the work themselves, have succeeded in opening up a mine that has made them rich. There is one case we call to mind, that of Mr. Weske, where the projector, without scarcely any capital but his hands, succeeded in opening up a rich mine in these gravel beds. But the privations and hardships he underwent required pluck that few men possess. Spending all the money he could get hold of he next resorted to credit, and when his money and his credit were both exhausted, he did not quit, as many would have done, but, nourished by lager beer and crackers, he kept digging away until the goal was reached. In a short time after striking gravel he was able to pay off all his debts and have enough left to make him independent. Other local miners have associated their capital, and in this way most of the mines now opened on that divide have been developed, and there are many of them, though few, indeed, to what there might be.

The Hidden Treasure, opened but little more than a year ago, was developed and fitted up by a combination of sturdy, industrious, and enterprising local miners, and, as is proved from its appearance and its monthly clean-ups, it is now one of the best drift claims in California. Numerous are the instances we might refer to to demonstrate the result of local enterprise. These agencies are doing well in their way, they are doing all they have power to do, but when they have done their best the work is trifling compared to the extent of the field that is there inviting enterprise and labor. So much for that.

Now, as to why those running off to the Black Hills and Arizona do not come here, where work is sure and investment comparatively safe, instead of running off to those desert wilds where all is uncertainty and starvation a probability, we cannot answer. The reason to us has always been a profound mystery. It is one of those peculiarities in the manenverings of mankind, which has characterized every age, and for which metaphysicians have never been able to account. For years miners have been leaving California and going thousands of miles for the chance of striking worse diggings than they left. They will continue to do it in spite of the dictates of sense and the teachings of the press, until experience, dear and hard to acquire, convinces them of their error, and then a reaction will take place, and California, that has done so much for mankind, and that still stands with outstretched hands offering golden opportunities to all who will have them on her terms, which are application, enterprise and industry, will get her just dues and again astonish the world with her mineral wealth.

As to why those who have been putting their money in Washoe wildcats do not stop it and turn here for safer investment, is owing largely to that peculiar faculty of human nature which causes man, regardless of the future, to seek excitement rather than stability. So long as the Washoe mines could be made the base of excitement and a fortune could occasionally be made by one out of a thousand dealers in the

stocks of those concerns, men would invest their money in Washoe to the great exclusion of the large fields inviting honest and safe investment at home.

In these conditions, however, a change is taking place. The tendency to run off into wild countries on uncertainties is giving way before the solid attractions that home still holds out to all and the excitement that has attended the development of the Comstock lode is relaxing into sober calculations of actual results.

The speculative world, particularly that part represented for years on California street, San Francisco, is settling down to realities. Most of the operators there made their raise in California mines, and, having done so, rushed off there to invest it, and became, as they imagined, millionaires. For years they have played with the mining hubble, but finally it has hurstled, demonstrating its illy nature, and leaving many who placed their dependence in it much worse off than when they began. The lesson has been a dear one to California capitalists, but let us hope it has been well learned. We believe it has; we believe the moneyed men of our State are beginning to realize that California still offers the safest and most profitable field for investment. We say we believe this because we notice that the boys are "coming back." Those who years ago made money in the mines of California, and who hoped to double it in the twinkling of an eye by investing in wildcat mines away off over the mountains, now see their folly; they have got tired; they are beginning to realize that California is the best mining field yet, and they are beginning to come back. California mines are again coming in demand, capitalists are turning their attention this way for investment. Under these circumstances it is no wonder that the vast gravel beds of the Forest Hill divide should become a favorite field for location and investment.

Under the impulse of the new order of things, a number of locations have recently been made in that region by parties from below, several important purchases of mining property have recently been consummated, by capitalists who propose to change their base of operations from the other side of the mountains to this side, and hundreds of others are turning wistful eyes in that direction.

## Mines of Arizona.

From Mr. Ike Bradshaw, an old experienced miner who came to Arizona in company with his brother, after whom the famous Bradshaw mountain was named, and John Tatman, the *Arizona Miner* has elicited the following reliable information in regard to their mining prospects and future outlook:

The King, in Pinal county, owned by Barney & Regan, is down 180 feet, and a large mass of ore, the same as that found on the surface, continues to exist, which averages, good and bad, \$600 to the ton. Concentration works are being erected for the reduction of the King ore preparatory to shipping the same to San Francisco. The real worth of this mine is hard to determine, but enough is in sight at present to justify the assertion that it runs into the millions.

Again, on the South King three shafts have been sunk to a depth of 90 feet, each displaying a ledge of well defined properties, and the ore equal to that of the original King.

Thirty-two miles northeast from the King is situated the Glohe district, which contains many leads of wonderful richness. Probably first among these might be mentioned the McMullen, which is being worked successfully in a five-stamp mill which has been erected at the mine. They have a shaft on this lead 60 feet deep, and the ore is of a character that would dazzle the eyes of even old timers who are used to all kinds of mining. Glohe City is here located and has a population of some 200 souls, contains stores, saloons, livery-stables, etc., and is, take it all in all, quite a lively town.

Ten miles further north and east is the Richland Basin, where the noted McMorris lead exists, which is paying all the way from \$1,000 to \$14,000 per ton. The lead is two and one-half feet wide with well defined walls, and has every indication of being a permanent lead. The owners are now in San Francisco with several tons of the richest ore, which is believed will pay \$12,000 to the ton.

Cave creek, north from Camp McDowell and south of the Bradshaw, has a large number of gold leads, all of which are being developed. Some have shafts sunk 180 feet deep, and the showing is flattering. Messrs. Hellings & Veil have a good lead in this district, and are about to erect a small mill at their mine.

In Old Bradshaw work is being done on all the leads, and as work progresses the leads show to be of a permanent character and the utmost confidence is felt by the owners that the day is dawning when Bradshaw will become another Comstock. On the Tiger, War Eagle, Lorenzo, Cougar, Eclipse, and the hundreds of other leads work is being prosecuted and much valuable ore is being piled upon the dumps at the different mines, waiting the advent of machinery wherewith to reduce and separate the valuable metal from the valueless rock and dirt.

In the Peck district great activity prevails, and an idle man is looked upon as a kind of curiosity. The Peck mine is acknowledged to be the best so far as discovered in the Territory, and the yield is perfectly astonishing. Thousands upon thousands of dollars are being ship-

ped monthly to California from this grand old mine.

In Turkey Creek district the same interest is being displayed in developing the rich deposits of silver which exist in the Peck district. The time is not far distant when Turkey creek will be turning out hulkion that will undoubtedly astonish some of the non-believers.

Closer at home we have the Zalida, in Lynx Creek district, a comparatively new lead, but one that bids fair to cope with such mines as the Peck, King, Tiger and others. The Miriam is also attracting much attention and is thought to be a true vein and one of great richness. The Cumerland also bids fair to become a good lead. In fact, we cannot turn our eyes in any direction but what they look in the direction of the hills which contain wealth of untold magnitude now being grappled for by the hardy, industrious miner.

## The San Juan Region.

Topographically, says the *Colorado Springs Gazette*, the San Juan country is the region drained by the San Juan river, and consequently lies entirely on the west slope of the main or continental divide. Sometimes, by persons who wish to speak or write exactly, this section is designated as "San Juan proper."

The country known to popular understanding, however, as the San Juan, is something far wider, although its geographical limits are as yet loosely defined. This is because its different districts or sections have been discovered and developed one after another, and discovery and development are going on yet. It includes in this sense the Animas, Eureka, Summit, Lake, Rosita, Uncompahgre, Gunnison, Alamosa and other districts, differently laid out and bounded by different local authorities. It will probably include yet other districts as they take shape and form out of the unbounded hills. It is this vast range of territory, veined with mines and literally inlaid with wealth, which every month is revealing, that is in common acceptance "the San Juan."

Perhaps the description which would present it in clearest and strongest relief to the common mind, would be to define it as the region of the mountain ranges which enclose the magnificent San Luis valley. The San Juan country is literally the silver walls of the San Luis valley and all they hold. Take the well-known mining districts from right to left as they encircle the San Luis—Rosita, Lake, Gunnison, San Miguel, Uncompahgre, Eureka, La Plata, Las Animas, Summit, Alamosa—and you have the San Juan.

This clearly understood, one begins to have an intelligent conception, not only of the vast wealth and the magnificent future of the San Juan, but of the strong position which it holds in itself and in its relation to the surrounding country. It is a State in itself—a rich, fertile valley, with the dark alluvial soil the farmers love, threaded by streams of good water and girded by hills whose crests are covered with forest timber, and whose ribs are veined with copper, iron, coal, silver and gold. It is a region for the farmer, the grazer, the miner, the manufacturer. They can live and do live there now, and each is a market for the others.

Enclosed ranch ranges, one to five miles in length, can be seen near Del Norte. Large farms of hursting crops smile along the Rio Grande, and yet the country is but touched, so vast, so rich, so new it is. Five thousand mines are already located and 5,000 more can be found. Over a million acres of arable farm land is yet open to homestead and pre-emption, and the Government has just planted a new Land Office at Lake City, to facilitate settlement and convenience settlers.

This is the country which the Denver & Rio Grande has entered at Garland and flanked at Canyon. And this is the meaning of the brilliant passage of the *Sangre de Christo* range at La Veta. The silver walls which shut in this empire with ranges of precious stones, also shut out the approach of the rest of the country to it, save by difficult and almost inaccessible passes. These the narrow gauge has mastered and occupied, and to-day she "holds the fort" of San Juan.

**SAIL VS. STEAM.**—Those "old sea dogs" who are never weary of trumpeting their belief that the British navy began a downward and ruinous course with the introduction of steam, may record another triumph. According to information from Bermuda, Her Majesty's wooden sloop *Dryad* (9) is in a pickle with her machinery. It appears that one of the *Dryad's* cylinders has been reduced till it is now less than three-quarters of an inch thick. As a result, the authorized pressure has been brought down to 17 pounds (!), not more than 45 revolutions are to be made, and the vessel is not to get under weigh till steam is up in all four boilers. Here's a pretty kettle of fish, and the *Dryad*, with nine months of sea time to make before she can leave the station! But we are getting used to this sort of thing at home, and no one seems now to care very much how often this or that man-of-war gets out of gear. On a foreign station, however, to say the least, such a contingency may turn out an awkward mess. On the other hand, if we may judge by what appears to be a pretty general feeling, the crew immediately concerned will rather prefer the change, for it is not too much to say that the objection to ironclads and steam power is pretty general with our A. B.'s.—*Iron*.

## Experiments with Tonite.

On Wednesday several interesting experiments were made in a field at Farnley wood, near Messrs. Clayton and Speight's coal-pits, by Mr. T. Dineen, of the firm of Dineen, Son & Co., Leeds, with their new explosive called "tonite." The experiments were undertaken at the request of a number of gentlemen connected with ironworks, iron mines, quarries, coal-pits, etc., and among those present were Mr. Ezra Woodhead, chief manager at Lowmoor ironworks; Mr. Hezekiah Tempest, manager for the same company at Beeston; Mr. S. Robertshaw, chief manager at Farnley ironworks; Mr. Clayton, one of the proprietors of the ground where the experiments were made; Mr. David Nickols, huilder, Leeds; Mr. Wilkinson, Beckett Street colliery; Mr. Henry Birkby, of Wike brickworks; Mr. Briggs and Mr. Topham, Leeds, and others. The object was to show how the explosive could be used in clearing land of trees, stumps and houlder stones, as well as in quarries and ironworks, in breaking up slag, old iron, etc., and to prove its perfect safety in handling, transit, storage and use. The "tonite," or "patent cotton gunpowder," is of a very different nature from dynamite or gun-cotton, and Mr. Dineen claims for it that it will not explode, except when a cap or detonator, specially provided for it, is inserted in a cartridge with a lighted fuse attached. It then explodes with a loud report, but produces no smell, smoke, or poisonous fumes. It contains no nitro-glycerine, nor dangerous compounds of any kind and has no means of igniting within itself. To prove the safety and strength of the powder, Mr. Dineen cut a cartridge in two pieces. On one portion he poured nitric acid, and sulphuric acid, to show that acid would not burn it. With a match he then lighted the portion of the cartridge which he held in his hand, and threw it into a small pool of water, the result being that the flame was at once extinguished.

To show the effect when the proper cap and fuse were attached, he took a cartridge, and having lighted the fuse, threw it into the pool. The spectators retired a short distance, and soon a loud explosion occurred, and the water was sent to a great height. To prove that concussion in transit would not cause the tonite to explode, Mr. Dineen placed a cartridge on a brick and struck it a blow with another brick. He next placed the cartridge on a stone with a fuse attached, and covered it with a small quantity of clay. On being fired the stone was broken into fragments, thus showing the downward power of the explosive. Another proof of the safety of the tonite when no cap and fuse are attached was given by Mr. Dineen, who put two cartridges over a small bag of gunpowder; on being fired the gunpowder exploded, but the only effect upon the tonite was to ignite it. Cartridges were also placed under the stumps of trees, and these were shivered into fragments. Seven cartridges were then placed beneath a stone which weighed between two and three tons, and the result of the explosion was to break the stone into a great many small pieces. Another large stone was fired from the top, with only a little clay over the cartridge, and the result was the same. A piece of an iron rail was then brought forward. It was two feet by four inches by two inches, and weighed 36 pounds. A cartridge having been placed beside it and fired, the rail was broken into four large pieces, in addition to many smaller ones. At the close of the experiments, when many people had left the ground, Mr. Robertshaw and Mr. Tempest expressed a desire to have the tonite tried on a piece of rail made from the best Yorkshire iron manufactured at the Farnley works. Accordingly a piece of rail was brought which measured six feet by four inches by two inches. In the first shot three cartridges were applied, and on being fired the rail was completely fractured. A single cartridge was then applied to one of the broken pieces, measuring two feet six inches in length, and the result was that the rail was splintered and scattered. The gentlemen present expressed themselves as entirely satisfied with the experiments.—*Leeds Mercury*.

**TURNING OUT RICH.**—The new quartz ledge which was recently discovered, and is now being worked by Beedle & Co., is turning out splendidly. Last week they took out six and a quarter tons of rock and had it crushed at Church's Gold Run mill. On Saturday evening last they got returns from the crushing, which was \$600, besides \$150 worth of specimens. The rock in sight presents the same appearance as that which has been crushed, and they will take it on as fast as possible. They are down about 20 feet, and have a ledge of about one and a half feet thick. This mine is situated a short distance beyond Geo. Smith's, at the Half Mile house, and near the junction of the Grass Valley and Rough and Ready roads. The discovery of this ledge is a very important one and confirms the belief entertained by many old miners that at some time very rich ledges would be found in that vicinity. Several companies in years past have spent considerable money near the place of the new strike, but failed to find any rock that would justify working. This strike will give a fresh impetus to quartz mining in that part of the town and we would not be surprised before long to hear of richer discoveries than that of Beedle & Co. being made. Prospecting has got another fresh start here and a great many men are out on the hills in search of ledges.—*Nevada Transcript*.



## The Metallurgy of Tellurium Ores.

It is evident that during the last six months much has been done in the tellurated mines of Colorado. This noted belt of veins has been the source of much trouble to miners and mill men, and has been the grave of much money. In spite of the numerous failures which accompanied its early development, work on a large number of mines has been vigorously prosecuted, and to-day the district contains at least a dozen fine properties about whose intrinsic value there can be no doubt whatever.

We desire to refer, however, more particularly to the efforts that have been made to beneficiate the ore. An entirely new product (to the Colorado minor), was quickly found that it would not be amalgamated, could be roasted only with great danger, and was exceedingly difficult to concentrate without heavy loss. The extreme richness of the higher grades rendered experiments very costly, while the lower grades, owing to the extreme discrimination of the telluride minerals, were exceedingly difficult to handle. But one process succeeded invariably, viz.: the smelting process at Black Hawk and Golden. By reason of the diversified products bought and treated, these works were enabled to overcome the peculiarities of the telluride ores by mixing small quantities with large amounts of other material.

No other works in the State were in such a position, and, as the prize sought was one well worth struggling for, the processes invented and patented for specially treating tellurides have been almost innumerable. Large amounts of money have been sunk in mills recklessly planned and too hastily erected. The amount of absolute folly shown in these endeavors surpasses belief, and it is to be regretted that there is still much of this going on. But a discussion of this point is not at present intended. We desire to state the present condition of Colorado beneficiation works handling exclusively these telluride ores, and to give a brief description of the mineral found and its peculiarities.

The telluride belt lies in northern Colorado. It traverses the divide between Left Hand and Boulder creeks, and extends to the north and south of each for a distance of seven miles. Its width is about four miles. Within these limits there are many hundred veins located; many thousand in fact, the great majority of which carry tellurated ores to a more or less extent. The ore occurs as telluride of gold, silver, lead and mercury. In a number of notable instances pockets or chimneys of exceedingly rich mineral have been found, but in most cases the tellurides are disseminated in minute particles through the vein, so that the ore seam taken out in bulk would not yield over \$30 per ton. Peculiarities in the condition of the mineral have been found in different veins. In some cases high crystallization predominates; in others this state is almost wholly absent. A peculiarity has also been noticed in some varieties comparable to the "rusty" condition in gold. Concerning this last but little is known. In fact, there is still more of conjecture than knowledge in the entire question, and we can hope for but little light regarding these rare ores until a careful and exhaustive study of these chemical peculiarities is made.

It has been demonstrated, however, that it is unsafe, as well as unscientific, to roast telluride ores alone. This being the case, amalgamation, lixiviation and chlorination are wholly inapplicable. As smelting is the only system of reduction left, and as that is wholly impossible with low grade ores, it was thought by many last year that there was no salvation for the mines unless a new discovery in chemistry occurred. This belief did much towards supporting the numerous patent processes which have of late come to the front, and in a measure excuses much of the credulity with which such absurdities as the Brett and Kindred processes have been received.

Lately, however, and none too soon for the welfare of these mines, attention has been drawn to concentration, and the results, after at least six months of test, have been so favorable that there can be no doubt that this branch of metallurgy offers a correct solution of the entire question. We are not to be understood to say that nothing is left to be desired, for that would be giving too much credit to a system which is at best but auxiliary, but for the present there is one point fully decided. It is possible to work almost all tellurides having a value when raw as low as \$20 per ton. We qualify this statement because there are yet several veins in this belt of mines which have not been successfully handled by concentration machines.

Success, however, has only as yet been accomplished by one machine, the Frue vanner. There are now 12 of these machines in operation in Boulder county on telluride ore, and so complete has been their success that more concentrate is being shipped from the telluride belt than high-grade ore. In other words, these vanners have rendered available already such a large quantity of low-grade ore that the product from these is already larger than that direct from the mines. These concentrates are selling at valuations of \$300 a ton and upwards to \$3,000.

It appears, therefore, that, though the tellurated minerals of Colorado must still be smelted, the great bulk of these ores which have hitherto been regarded as nearly, if not wholly, unavailable, have already become of more worth to the miner than the marvelously rich pockets which have been and still are being

found. It may fairly be claimed, therefore, that a tremendous stride in advance has been taken. And that there no longer exists that element of uncertainty in handling this class of mines which has heretofore retarded investments and discouraged miners.—*Cor. Engineering and Mining Journal.*

## USEFUL INFORMATION.

## Sand for Foundations and Other Supports.

Contrary to the popular notion, sharp sand is an excellent material to support heavy weights, as the mutual friction of the particles prevents any pressure applied on the top from being transmitted sideways, as is the case with fluids, and also to a certain extent with quicksand, which is simply sand containing too much water. The *Manufacturer and Builder* notes that it is sufficient to inclose sand in a cylindrical thin wooden or iron box, and if well shaken down, it will support very heavy weights, which must be placed in the sand alone, and not touch the walls. A box filled with sand is an excellent support for anvils, or for any work where heavy blows or pressure is to be resisted, as sand will sustain much greater weights and resist stronger blows than any solid block of wood of the same size. Another objection to wooden supports is the sound and jar they communicate to the floor on which they rest; for this reason jewelers and others who work on anvils placed in upper stories, place their anvils on cushions, gaining in this way a double advantage—not only stopping the jar and noise, but also making the blow of the hammer more effective. Any observing person of some practical experience must have noticed that the effect of a blow given on a stone or a piece of ice is quite different when we lay it on a hard support from that when we keep it in the sand; in the first case, the stone or piece of ice transmits the blow to the support; in the second case, it receives all the effect itself. Even thus the anvil, placed on a wooden floor or beam, will transmit the blow to the floor or beam, and cause a sound and jar; while when placed on a cushion or on sand, the effect of the blow will be concentrated on the anvil, and the effect of the blows will be comparatively noiseless.

Architects have long known how good a foundation sand is as a support for heavy columns and walls; and as an illustration we may point to the Cooper Institute in New York, the walls of which, and the many iron columns in the large basement hall, have nothing but sand for a foundation, notwithstanding they support the heavy masonry interior walls and iron beams of this fire-proof structure, 100 feet high above the street. This building has now stood some 20 years and no settling of any consequence has been perceived.

**CLASSIFICATION OF LOCOMOTIVE ENGINEERS.**—The following order, containing information which our railroad readers may be interested in, dated July 1st, is issued over the signature of James Sedgley, General Master Mechanic of the Lake Shore railway: "On and after July 1st the classes enumerated below will be established for men promoted upon locomotives. Promotions will hereafter be made from lower to higher classes, if found worthy, upon completion of the service here specified. The fifth class, consisting of engineers promoted from firemen to switching engines, to run 30,000 miles before further promotion. Rate of wages \$2 per day. The fourth class, consisting of engineers promoted from the fifth class, to run in this class until promoted to road service, rate of wages to be \$2.16 per day. The third class consisting of engineers promoted from the fourth class, or switching to road service, to run 40,000 miles before advancement. Rate of wages to be two and one-quarter cents per mile. The second class, consisting of engineers promoted from the third class, to run 50,000 miles before advancement. Rate of wages, two and seven-tenths cents per mile. On the completion of these services they will be promoted to the first class. Rate of wages, 3.15 cents per mile. For superior merit, Division Master Mechanics may advance men from the lower classes to higher before the completion of the whole service specified, reporting such promotion to the General Master Mechanic."

**NEW SOAP-MAKING PROCESS.**—Soap, says the *Manufacturer and Builder*, may be made without caustic soda and without quicklime, by making use of the property of ammonia to combine readily with fat, and to make a very soluble soap, and of soda soap to be insoluble in water if this contains only the small quantity of more than one-half of one per cent. of salt. If therefore, grease, fat or resin, which are commonly employed to make soap, are heated with an excess of common salt, ammonia and water, a soda soap separates, leaving chloride of ammonia in the liquor, together with the excess of ammonia and salt. The ammonia at first unites with fatty acids, and forms a very soluble ammonia soap; then the sodium in the salt exchanges places with the ammonia in the soap, forming a soda soap and chloride of ammonia. It is essential that there be an excess of ammonia and salt present in order that the reaction shall take place. One hundred parts of grease require from 15 to 20 parts of ammonia, 20 to 30 parts of salt, and 200 to 300 parts of water.

## Hints to Carriage Painters.

The *Carriage Monthly* gives some suggestions on painting, from which we take some notes on priming: Never prime a piece of wood, especially hard wood, unless certain there is no moisture in it. Run all wheels out in the sun, or dry by artificial heat before priming, and if painted as described in hurried work, they will not scale, crack or blister. Use more or less oil, according to the time required for finishing; on slow work oil will take the place of varnish. Do not put on one coat and let it stand a long time without sanding, and never put a thick coat on bone dry work. A job painted in this way, with an extra coat of rubbing varnish, allowed to stand a week or more, then rubbed out and well varnished, and kept away from mud and water for one month, will hold its gloss equal to oil work, and will not crack nor have the small-pox and come off generally. If necessary to hurry it still more, use more japan and varnish and less oil, thinning well with turpentine.

Do not put a dry, flat coat on glossy oil, nor vice versa. Be sure your job is free from moisture, so that it will drink in the priming. Make your priming thin enough with turpentine, so that it is drink and not victuals. Make each coat as near like the last as possible, put them on as soon as dry, and they will form one solid coating; then if you have time, let them thoroughly dry before varnishing. For wood work to keep in stock a long time, prime with best pale lead, boiled oil and a little turpentine.

**PETROLEUM AS FUEL FOR SHIPS.**—The neighborhood of the naphtha springs of Borkon has suggested the idea of using mineral oil as fuel for the Russian flotilla stationed in the Caspian. It is more than a year since the first experiments were tried, and a steamer, a schooner and a gun-boat are already heated by this means. The result has proved so satisfactory that the boilers of four other vessels are being altered to adapt them to the new system; and, for the future, naphtha will probably be more extensively used by vessels in the south of Russia.

**A SUGGESTION FOR TRAVELERS.**—The *Railway Age* says: It would be an excellent idea to require passengers at way stations to invariably enter the cars at the front and leave them at the rear end. This would prevent the crushing and struggling that generally attend the stoppage of trains at intermediate stations, by which much time is lost and much bad temper is excited. Notices posted in the cars and a little attention by the trainmen would soon establish the custom as one of the rules of travel, which few would think of violating.

## GOOD HEALTH.

## Heart Disease.

At a late scientific congress at Strasburg, it was reported, that of 66 persons who had suddenly died, an immediate and faithful post mortem showed that only two persons had any heart affection whatever; one sudden death only, in 33, from disease of the heart. Nine out of the 66 died of apoplexy, one out of every seven, while 46, more than two out of three, died of lung affections, half of them of "congestion of the lungs," that is, the lungs were so full of blood they could not work, there was not room for air enough to get in to support life.

It is then of considerable practical interest, says *Hall's Journal*, to know some of the common every-day causes of this "congestion of the lungs," a disease which, the figures above being true, kills three times as many persons at short warning, as apoplexy and heart disease together. Cold feet; tight shoes; tight clothing; costive bowels; sitting still until chilled through after having been warmed up by labor or a long or hasty walk; going too suddenly from a close heated room, as a lounge or listener or speaker, while the body is weakened by continued application or abstinence, or heated by the effort of a long address; these are the fruitful, the very fruitful causes of sudden death in the form of "congestion of the lungs;" but which being falsely reported as "disease of the heart," and regarded as an inevitable event, throws people off their guard, instead of pointing them plainly to the true causes, all of which are avoidable, and very easily so, as a general rule, when the mind has been once intelligently drawn to the subject.

## Phosphatic Food.

The *Manufacturer* has the following plea for special feeding of the brain: Man is being perpetually renewed; the old and used-up particles are removed from the system and their place is supplied with the same element newly presented to the organism. Motion destroys a portion of the integrity of a muscle, sight a something from the retina of the eye, and "thoughts which breathe and words which burn," literally burn and change into another chemical formula a certain portion of the phosphorus of the brain. Hence arises the necessity of supplying the system with an element on which the mental functions depend more than on any other inorganic ingredient. Experience shows that highly phosphatic and easily digested food, such as soft-boiled eggs, boiled fish, the flesh of fowls, oysters and kale food

(phosphorized more than most other grains and vegetables), is especially suitable to persons whose minds are overtaxed by intellectual duties, and in purely nervous affections it is recommended by physicians who understand their business. Very recommendable for this purpose is the liquid acid phosphate, because it contains the phosphorus in a condition in which it is most easily assimilated. The idea of partaking of particular kinds of food or beverages to nourish the nervous system is rapidly gaining ground or theoretically accepted as correct. Said a physician lately to us, with whom we conversed on this subject: "What a fool was I in my ignorance to laugh at the idea of brain food. Why, sir, it is the most valuable one I ever put in practice. I thank you chemists for it."

## Potatoes for Food.

Dr. Hollbrook, editor of the *Herald of Health*, writes the *Dining Room Magazine*: For my own part I am not much of a believer in potatoes, except for those whose labor is largely muscular and in the open air. For such they are valuable. The reason I object to potatoes is because they are composed very largely of starch, and starch is too difficult of digestion for those with only moderate stomach power. In order to serve its purpose in the system it must first be converted into sugar, and this is done first by most thorough chewing, and then by being mixed with plenty of pancreatic juice in the intestines. Not one person in 10,000 chews a potato finely enough to convert its starch into sugar, so much of it passes out of the body undigested, and the body suffers for lack of nourishment. Dyspeptics, nervous people and brain workers should not eat potatoes except in great moderation, and I generally advise them not to eat them at all. They do not contain phosphorus and mineral matter enough for the nerves. They are apt to produce a condition of nervous despondency which is very depressing. I know a person who, after eating heartily of potatoes once or twice, experiences a tendency to commit suicide, which goes away at once after refraining from their use for a day or two. I have advised many invalids to let potatoes alone, and to great advantage. Adding butter to potatoes is a mistake. True, it makes them taste better, but the melting butter covers the starch grain with a coat of oil which prevents the juices of the intestines from getting at it; and as for the gastric juice, it has no influence on starch and cannot digest it. If eaten, they should be eaten with a little salt and pepper, but without butter. The best way to cook them is to boil or bake and serve hot and mealy.

**A NEW VIEW OF CONSUMPTION.**—Dr. F. J. Bancroft, President of the State Board of Health of Colorado, in the first annual report of the board, makes the suggestion that phthisis properly belongs to the class of "filth diseases," and can be controlled and prevented by attention to cleanliness. He supports this view by the fact that tubercle is inoculable, and may enter the body through contaminated drinking water. In Colorado phthisis was unknown until cases from other States brought it there. Now it is found among the native population. "This view," as another writer remarks, "receives very strong support from the history of health resorts in Europe. The time was when phthisis was practically unknown in Madeira, in Naples, in Malta, along the Riviera and the upper Nile. Consumptives flocked there in crowds, and now in all these districts the native population succumb to the disease in quite as large proportion as elsewhere. The practical lesson is that equal care about disinfection and sanitation should be exercised in regard to consumption, as in regard to typhoid or scarlet fever."

**KEEP CISTERNS CLEAN.**—At a recent meeting of the Royal Society of Arts, in Edinburgh, Dr. Stevenson Macadam read a paper on "Sediments in Domestic Water Cisterns," in which he expressed the conviction that in many cases the evil effects of impure water supply were directly traceable to the contamination of the water by its being retained in cisterns containing deposits lying there for lengthened periods. The analyses of a number of sediments taken from cisterns in different parts of Edinburgh and Portobello proved that the deposits were intermingled with minute particles of carbonate of lead, due to the action of the water upon the lead of the cistern, as well as of organic matter, derived in part from the ordinary street or house dust, and in part from insects, etc. Analyses of the water supplied to the city before entering the house cisterns, and of the water which had stood for a week over the deposits or sediments from cisterns, showed that the water had suffered serious contamination. The only way to obviate this is by the periodic cleansing of the cistern; and this should be done at least every three months.

**STIMULANTS USED BY THE RACE.**—The *Quarterly Journal of Inebriety* says: It is estimated that coffee, both beans and leaves, is drunk by 60,000,000 of the human family. Tea of all kinds is used by 500,000,000 and opium by 400,000,000; alcohol, in its various forms, by 500,000,000 of the human race. Tobacco is probably used by 700,000,000 or 800,000,000. These startling facts indicate a large proportion of the race using some substances that are either stimulants or narcotics. The work of the physiologist, in the future, will be to determine the true place in nature of these substances and indicate where their use ends and abuse begins.



# MINING SCIENTIFIC PRESS

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## The Week.

The past week has been fraught with events of a most exciting nature over a great part of the United States, as well as in California. The great strike, which has grown to the dimensions of an agrarian insurrection, is the topic of the hour. It has spread to all quarters, and as we write (Thursday) shows no appreciable diminution. The existence of mobs, pillaging and burning in many cities, has paralyzed business of all kinds, and affairs generally are in a most unsatisfactory condition. Here in this city a mob of hoodlums are endeavoring to take the law into their hands, and on Wednesday evening an incendiary fire destroyed a hundred thousand dollars' worth of property. The reckless, criminal classes of the community have taken advantage of the strikes of laborers and mechanics to foment disturbance and organize a mob. A vigilance committee—a "Committee of Safety"—has been organized to assist the authorities in quelling the disturbance, and it is to be hoped that the city will be spared any repetition of the disgraceful scenes of Wednesday night. It behooves all law-abiding citizens of every class to aid in suppressing violence and to counsel moderation in such trying times. Even just demands of workmen are not to be carried out by violence and destruction of property; and as the loss in such cases falls on the communities in which it occurs, all good citizens should do their best to suppress lawlessness of any kind. The times are hard enough on this coast now, and it is to be feared that if further riotous demonstrations are indulged in and more property destroyed, business will be almost entirely suspended and hardships brought on all classes of the community.

## Quicksilver.

We gave the other day an article on the depression in the quicksilver trade, and an account of the mines which had shut down on account of the low state of prices in this article. We did not think, however, that any of the larger mines would shut down, but we see it stated that the Redington quicksilver company have concluded to stop four of their furnaces for the usual annual clean-up, and not to start them again after so cleaned up until there shall be a material advance in the price of quicksilver. The Napa Reporter says that they will in the meantime suspend the extraction of ore, deeming it more advisable to preserve in the mine their reserves of ore, rather than extract and reduce at the present very low price of quicksilver. They will continue to run their four fine ore furnaces, of the Livermore patent, on such accumulations of fine ore as they now have on the surface. The result of this partial stoppage will be the reduction of the company's product to something less than half what it has been for the past year.

Even in the best of times quicksilver mining has not been so profitable at all the mines as has been supposed. At the New Almaden for instance, the representative quicksilver mine of the State, the dividends to stockholders from 1864 to 1876, inclusive, were only \$492,950, and the assessments in the same time were \$214,560, making the net amount received by stockholders only \$278,385 in 12 years. The State and county taxes for the same period were alone \$123,662.

The following table from the San Jose Mercury gives the assessed valuation of the several quicksilver mines of the State of California for 1876-77.

Name of Mine.	Land.	Improvement.	Personal Property.	Totals.	Flasks Produced.	per Flask.	Valuation.
Redington.....	41,240	95,000	14,900	151,100	9,183	16.46	
Sulphur Bank.....	56,272	3,200	28,000	84,570	8,732	9.68	
Guadalupe.....	19,910	20,000	10,950	51,750	7,381	7.01	
New Idria.....	50,960	25,000	14,119	90,079	7,272	12.30	
Great Western.....	27,000	20,000	2,615	49,615	4,493	11.04	
Oakland.....	5,000	5,000	1,050	11,050	2,150	5.14	
St. John's.....	20,000	5,000	1,925	26,925	2,085	12.91	
Total.....	220,388	174,182	70,609	465,179	41,298	11.26	
New Almaden.....	150,000	150,000	91,115	391,115	20,631	18.06	

## Assessments, 1877-8.

Redington.....	36,240	80,000	8,875	125,115	.....	.....	.....
Sulphur Bank.....	50,750	63,900	9,235	123,785	.....	.....	.....
Guadalupe.....	23,350	65,500	10,900	100,750	.....	.....	.....
New Idria.....	30,900	20,000	5,385	60,545	.....	.....	.....
Great Western.....	27,000	20,000	2,515	49,515	.....	.....	.....
Oakland.....	5,000	5,000	2,740	12,740	.....	.....	.....
St. John's.....	20,000	5,000	765	25,765	.....	.....	.....
Total.....	196,300	256,300	44,715	497,315	.....	.....	.....
New Almaden.....	150,000	100,000	51,820	301,820	.....	.....	.....

From these figures it will be seen that there is a remarkable lack of stability in the business of quicksilver mining, so much so as to cause it, in insurance parlance, among the extra hazardous risks.

Perhaps one of the strongest proofs of the fluctuations in the value of mines is given by the statistics of the New Almaden mines for 24 years, commencing in 1850. Its total production for the period was 627,002 flasks of quicksilver of 76½ lb each. The greatest number of flasks produced was 47,194, in the year 1865, the least number was 9,084, in 1874. The yield of quicksilver from the ore was an average of 36.74 per cent. in 1850, and an average of only 4.72 per cent. in 1876, thus showing a decline of 32.02 per cent.

The receipts of quicksilver at San Francisco for the first six months of 1877 were 36,955 flasks. For the same period of 1876 they were 27,618 flasks, showing an increase for 1877 of 9,337 flasks. The exports for the same periods show a large increase in number of flasks for 1877, at a largely reduced value. Thus, for first six months of 1877 the exports were 30,224 flasks, valued at \$1,015,574;—average \$33.66 per flask. For the corresponding period of 1876 the exports were 19,102 flasks, valued at \$835,800; average per flask, \$43.75; difference in value, \$10.15 per flask. By which, in striking the balance, we find the increased export of 11,122 flasks realized only \$179,774;—or an average of \$16.16 each, which was probably less than the cost of its production.

BILLION SHIPMENTS.—Since our last issue shipments of hullion from prominent mines have been as follows: Northern Belle, July 17th, \$6,916.36; Consolidated Virginia, 19th, \$249,333.62; total for July account, \$293,923.87; California, 19th, \$124,590.92; total for July account, \$503,931.89; Northern Belle, 15th, \$9,323.60; Modoc, 18th, \$3,911.74; Tybo Consolidated, 17th, \$4,044.46; Modoc, 20th, \$4,230.20; Tybo Consolidated, 10th, \$4,111.80; Endowment, 23d, \$6,119.23; Northern Belle, 19th, \$9,227.35; Modoc, 20th, \$4,230.20; Con. Virginia, 23d, \$210,756.46; total to date, \$504,679.83; Modoc, 22d, \$3,467.90; total to date, \$36,195.62; Arizona, 22d, \$2,136.56; California, 23d, \$184,235.25—total to date, \$688,167.14; Leopard, 24th, \$3,600; Tybo Consolidated, 21st, \$3,395.33; total to date, \$50,270.61; Raymond & Ely, 19th, \$6,432.50.

## The Great Strike and its Consequences.

The events of the past few days have been, perhaps, the most grave and wide spread in their occurrence and consequences of any which have ever taken place in connection with labor strikes. On Monday or Tuesday of last week the telegraph briefly informed us that a somewhat serious strike was in progress on the Baltimore and Ohio railroad, at Martinsburg, in West Virginia. As there is no organized military in that State, and as the trouble became at once of a nature which required forcible resistance entirely beyond the local police force, the President was called upon to use the national authority to suppress the riotous disposition of the strikers. A company of United States troops were promptly sent to Martinsburg, between whom and the strikers a collision occurred which resulted in the killing of one or two of the latter. This act greatly incensed the strikers, who thereupon gathered in still larger force, and by emissaries sent out along the road, from Baltimore to its western terminus, brought about a general strike. From this beginning, as our readers are well aware, the strike has been extended to nearly all the principal roads east of the Mississippi, and from them to a large number of the leading manufacturing establishments throughout the Middle and Western States.

There is no need that we should enter into any detail of the terrible scenes of carnage, fire and bloodshed which have resulted from the little spark first lighted at Martinsburg.

For a time it was hoped that, from the great distance which separated this State from the seat of disturbance in the East, and the total insimilitude of the circumstances surrounding the two localities, no outbreak would take place here. But the events of the past four or five days here show that we have an element in our midst fully as destructive and reckless as can be found in our sister cities of the East. This element is now in a state of most feverish excitement and ferment, and nothing but the most determined stand taken by the law-abiding citizens of San Francisco has thus far been able to keep it measurably under control. As it is, numerous acts of lawlessness and incendiarism have been committed—acts which will no doubt cost the city a large amount of money. Business has also been largely affected since Tuesday. In fact, as we go to press, but little is doing beyond the taking of still more effective measures to put down the riotous spirit which is now abroad in the city.

It is fortunate for San Francisco that such a large part of the middle and poorer classes in the city own their own dwellings, and are personally and pecuniarily interested in maintaining a proper observance of the laws, and in putting down any spirit of rioting at its first appearance. The parties who have thus far been engaged in breaking the law are thoroughly irresponsible persons, and are entirely beyond the sympathy and support of any respectable classes of society.

It is true that, in consequence of several successive dull years, and the present exceptionally dull one, wages on this coast have been somewhat reduced; yet they are much higher than at the East. Moreover, several large operators and employers, who had contemplated still further reductions, have, since the present troubles at the East, promptly announced that no further reductions will be made. Noticeably, in this connection, we may mention the Central Pacific railroad.

It is to be hoped that all good citizens will unite with each other in keeping order and quiet in our midst, and that all causes of agitation or irritation will be avoided, both in personal conversation, and, by all means, in the avoidance of public meetings which may seem to favor or look to any differences of opinion between employers and employed, or which, by implication or any other possibility, might tend to contumacious, initiate, or give impetus to disorderly conduct. We write on Thursday, and we trust that the events of last night may be the worst phase which the present disturbed state of society will fasten upon the history of San Francisco.

On the Constock, according to the News, the principal features of improvement in the mines are more and better ore at the 1000-foot level of the Justice, and in the double winze below the 1650-foot level of the bonanza. The bottom of the winze is now cutting through porphyry horse into the rich ore on the west side, as was prognosticated in our last week's report, and this horse is found to be much narrower than at the 1650-foot level. In all probability it will disappear entirely before reaching the 1750-foot level. The C. & C. shaft has reached the 1850-foot level, sinking amid great difficulty from the great influx of water, the miners working most of the time above their knees in water. In Carson river, on the contrary, there is a perplexing and continued decrease of water, so that milling is suspended to a considerable extent.

The Coroner's jury in the case of Wadsworth, Pennsylvania, mine disaster, where eight miners were killed, state that the mine was run in violation of law. General Pleasant, Chief Engineer; John Bowen, Superintendent; Edward Herbert and William Watkins, bosses, were required to furnish \$5,000 bail and appear for trial.

## The Dead Rivers of Sierra.

Boring with the Artesian Auger—The Eastern Channel.

In no part of California are the Pliocene river beds more numerous than in Sierra county, nor can their courses be anywhere else more easily traced than here. Three principal channels of this kind cross Sierra in a generally north and south direction, the most easterly passing in the vicinity of Gold Lake, the Keystone mine, Milton ranch and thence on in a southerly course by Nebraska and American hill to the extensive grounds of the North Bloomfield company, on the San Juan ridge, in Nevada county. Being deeply covered along its more northerly parts by volcanic outflows, this channel has been there but little worked, the only portions of it that have yet been much opened up being those lying to the south of the Middle Yuba, in Nevada county.

## The Next and Central Channel.

Being separated from the one just described by a space of eight or ten miles, comes in from the north by way of Canyon creek, Deadwood, Fir Gap, Monte Cristo, Forest City, Allegheny, Chipe Flat and Minnesota, in Sierra, continuing thence on by Orleans Flat, Moores Flat, etc., in Nevada county, where it appears to run into and intermingle with the more easterly channel. After passing into Nevada county, this central channel has been successfully worked at several places by the hydraulic process, nearly all the work done elsewhere along it having been carried on through shafts and tunnels, the overlying volcanic masses being here too heavy to admit of hydraulic washing. At all the camps mentioned, as well as at many other points along this channel, the diggings paid enormously in earlier days, and at several places rich claims are still being worked. All that is required, in fact, to get good pay anywhere along it, is to find the main channel and go to bedrock, near which the most of the gold lies. This channel, which, like the others, pursues a devious course and has numerous branches, is about 25 miles long within the limits of Sierra county.

The most westerly of these three channels, known as

## The Slate Creek Basin.

Is separated from the central one by a space varying from four to six miles in width. This channel is double, there being a branch on each side of the basin throughout nearly its whole length. Emerging from under Pilot Peak, an isolated volcanic cone 7,000 feet high, the main channel here pursues its way through a long series of mining towns and camps, of which Hesperidam, Gibsonville, Howland Flat, St. Louis, La Porte, Scale's Diggings and Brandy City, are the principal. Gold gathering is here conducted by both the hydraulic and drift methods, this having for many years been an active and profitable field of operations. In speaking of the gold sent out from La Porte, the central shipping point for this district, the estimates are often made by the ton, there having been transmitted through a single house engaged in the business at that place, considerably over one hundred tons, the transportation through all channels having amounted to more than \$100,000,000. While the surface diggings along this belt have been pretty well exhausted, scarcely any impression has been made upon the deep lying deposits that occupy the ancient river beds and their various branches, which will probably afford profitable work for centuries to come.

Already the channel of Slate creek has become so filled up with debris as to interfere with successful operations in many of the hydraulic claims along it, and in some, to stop washing altogether. With a view to obviating this trouble the Alturas gold mining company, who own something over three miles of this basin with its contents, propose to cut down the rocky barrier at its lower end and run out this vast accumulation of tailings, extracting from them at the same time the large quantities of gold they are known to contain.

In their efforts to reach the auriferous deposits resting in these several channels and their branches, the drift-miners have heretofore met with terrible losses of time and money, innumerable tunnels having been run here on levels too high or too low to properly serve the purposes of gravel extraction and drainage. That so many of the failures should have occurred in this neighborhood has been due to the fact that the old river channels are here covered up to such depths that it was impossible to put down shafts and ascertain their exact levels before commencing the tunnels. Of late these levels have come to be better understood, by reason of which, fewer mistakes of this kind have occurred than formerly.

## A New Method for Ascertaining the Position and Levels of the Old River Beds

Has recently been introduced, which, besides being attended with greater certainty, promises to much diminish the cost as well as the time before required for this purpose. This method consists of artesian boring, a plan first employed by the Pliocene company upon their extensive claim near Forest City, a few months since. The drill is here operated by means of a spring pole, the force used being hand labor, three men on eight-hour shifts sufficing to keep the pole in perpetual motion.

The claim of the Pliocene company, two miles in length, is situated on the middle chan-



nel, which, at this point, has, between the rim-rock indications on the surface, a width of about 3,500 feet, the gold-bearing portion of the channel at the bottom being from 400 to 500 feet wide, and lying about 460 feet beneath the surface. In having recourse to a shaft for prospecting these subterranean repositories, the trouble heretofore has been that its bottom might happen to come upon the high rim rock, leaving the miner in doubt as to which side of the center of the channel it might be on—a point that he would have to determine by drifting. If it were intended to hoist the gravel through it, a shaft so situated could not well be made to answer the purpose. If a tunnel were to be run, then such shaft, being off its line, could not be made available for ventilation.

If the first hole put down with the artesian boror proves to be not in the center or in the gold bearing portion of the channel, another or, if necessary, several others can be sunk in a line across the channel, until the central point is determined, and which being fixed, the shaft is there put down, the object of this boring being to ascertain exactly where the shaft, if it is intended to hoist dirt through it, should be sunk or, if a tunnel is to be put in, the precise point to which it should be run.

In sinking, this company have thus far averaged about 18 feet per day, working eight-hour shifts, with three men in each. They are now down about 200 feet, the work having been comparatively slow, the material penetrated consisting mostly of a hard volcanic lava, with many flinty boulders embedded in it, a sure indication, however, of the presence of a buried river below. Mr. E. S. Thurston, a thoroughly competent mining engineer, who has charge of the work, expects that he will soon reach the heavy sub-stratum of pipe clay, when much more rapid progress will be made, the drill being advanced from 50 to 60 feet every 24 hours.

As soon as the proper point for the shaft has been determined, and this may be accomplished by the first hole bored, the work of putting down the shaft will be commenced and prosecuted with all practicable expedition, it being Mr. Thurston's intention to have this structure completed and his gangways opened ready for taking out gravel during the course of the coming winter. This shaft will have three compartments, two for hoisting and one for pumping. For hoisting purposes, a steam engine, having capacity to do all necessary pumping and bring to the surface 500 carloads of gravel per day, will be provided.

#### Prospective Yield.

The Pliocene claim being on the same channel with that of the Bald Mountain company, one of the most productive in Sierra county, may be expected to yield as well as the latter, as only a single claim intervenes between them. A short distance above them the old channel has been cut by a deep ravine, revealing the lower stratum of the old river bed in all its richness, and establishing almost conclusively that the Pliocene company will have the same in their ground. Should such prove to be the case, it would bring to the company such reward as they well deserve for introducing a mode of prospecting these ancient river beds that promises such substantial advantages over those heretofore employed.

#### The Telephone.

One of the inventor's triumphs which will ever be associated with the coming of the Centennial year, is the transmission of sound by means of electricity. Long ago the telegraph learned to print and afterwards to indicate letters, words and ideas by means of the clatter of mechanism, but it is only about one year since the current of electricity first learned to carry the cadence of the human voice and the harmonies of music. This great step in the application of the electric current to the service of mankind was demonstrated to be possible by Prof. Graham Bell, a native of Scotland, but a resident of this country. His father, Prof. A. M. Bell, and he himself have become known widely as instructors of deaf mutes in a manner of speech. It is related that in one instance Prof. Graham Bell enabled a girl who had never produced an articulate sound to pronounce words distinctly after having her under his tuition for the short space of two months. "If I can make a deaf mute talk," the now famous inventor is reported to have said, "I can make iron talk." Whether he has made iron talk or not may be questioned; and yet it must talk, for it can listen and repeat what is whispered into its ear with the facility of an accomplished gossip.

Last year, when Prof. Bell first brought out his telephone, we made a note of it, and we have also mentioned the improvements which he has introduced from time to time, until it now stands a marvel of inventive success, if one considers the simplicity to which the machine has been brought in the short time since its first announcement. Although it is now a gratifying triumph, it cannot be doubted that there are still directions of improvement in the adaptation of the machine to all conditions through which sound must pass. It is, however, now so perfect as to warrant the public interest which it awakens and the tests of utility which are being placed upon it with a view to its industrial introduction.

About two weeks ago the telephone was

brought to the coast by Geo. S. Ladd, President of the California Electrical Works, and was exhibited to a private company, composed of journalists and others, and representatives of the Press were present. We secured from Mr. S. D. Field, Secretary, a drawing of the instrument, from which the accompanying engraving was prepared. It shows about one-half the actual size of the instrument. This sketch, we think, gives a better idea of the mechanism of the telephone than any we have seen elsewhere.

Speaking generally, first, the telephone consists of three parts; a horse-shoe magnet, around the pole of which are coils of insulated wire, with soft iron cores; in front of these is a diaphragm of thin iron, capable of vibration; in front of this is a funnel-shaped mouth-piece, by which sound is converged upon the vibrating diaphragm. These and the necessary framework to hold them in proper position comprise the chief parts of the instrument. Describing the telephone more accurately, with reference to the engraving:

A is the mouth-piece, through which vibrations of voice are projected against the diaphragm, C.

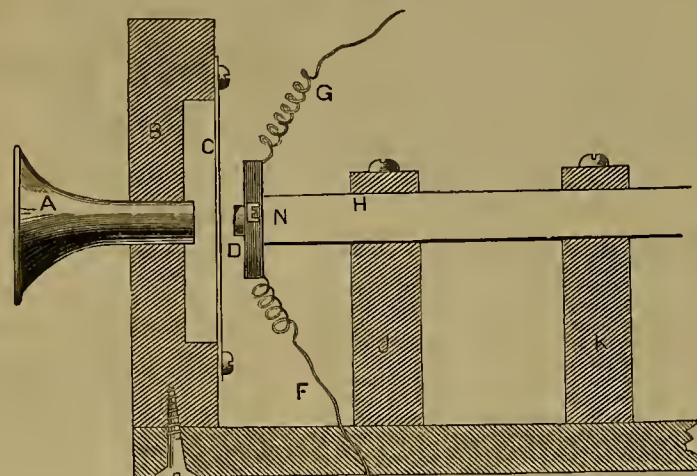
C is a diaphragm of Russia sheet-iron, circular and about four inches in diameter.

D is a soft iron core, polarized by the magnet, H; N marking the north pole of the magnet.

E is a helix or coil of wire, No. 32 gauge, with about 20 ohms resistance.

G is the wire to the line of telegraph extending to another telephone. F is the wire to the earth. B, J, K, are parts of the wooden frame by which the parts of the instruments are held in juxtaposition.

It will be noticed that our engraving shows the coil upon one pole of the magnet. The



PROF. GRAHAM BELL'S TELEPHONE.

other pole is similarly crested. The whole apparatus is enclosed in a walnut box five inches square and ten inches long, with the mouth-piece projecting through one end of the box.

The following is a condensed statement of the working of the telephone as noted by Mr. Field: A person speaking through the mouth-piece A, throws the diaphragm C into vibration; said vibrations being of greater or lesser intensity as the tones of the voice are higher or lower. The diaphragm C, in vibrating, approaches nearer the soft iron core D, thus drawing a higher magnetic energy within the coil E, from the magnet H. The effect of this change of magnetic condition in the core D is to induce currents of electricity in the helix or coil, E; these currents varying precisely as the tones of the voice in speaking. The effects of these currents flowing over the line into an otherwise quiescent telephone, at the other end of the connecting wire, is to reproduce synchronous vibrations in the diaphragm of the distant telephone and consequently similar articulate sounds.

At the trials which have been made with the telephones which have been introduced by the California Electrical Works, this power to transmit sound by electricity has been well proved. Conversation has been so accurately transmitted that listeners could distinguish the voice and inflection of those they knew. Tunes whistled have been carried note for note. Experiments have been made at considerable distances and have succeeded, so far as the operators could control the condition of the wires, etc.; for example, some words were made out in a circuit from San Francisco to Oakland by way of San Jose. These results are very satisfactory, considering that our local electricians have but little practice in the use of the apparatus. As this instrument has come to us it will doubtless be turned to account by those who desire speedy and facile communication between distant points.

The Board of Supervisors have elected as Water Commissioners, Isaac Friedlander and A. C. Merrill. The Board then adopted a resolution introduced by Supervisor Strother, requiring the two Commissioners to subscribe to an oath that they did not hold any of the Spring Valley Water Company's stock, were in no way interested in such stock, and were not related by blood or marriage to any person who was interested in such stock. The order appointing Messrs. Friedlander and Merrill Water Commissioners was then passed to print.

#### An English Decision in Favor of the Dynamite Patents.

We give below an important decision in a patent suit, before an English Court, in favor of what is known here as giant powder. The suit was brought by the British Dynamite Company, (limited,) against Krebs. The following is the decision, which we take from the London Mining Journal of June 23d:

This was a patent suit relating to explosive substances, of interest in its subject matter, from the extraordinary physical qualities that have been discovered apper- a-ning to explosive substances, especially nitro-glycerine, and also as illustrating the quicksands an inventor has to steer through in taking out and substantiating a patent. The plaintiffs, when the bill was first filed, were the British Dynamite Company, then the owners of patents taken out by Mr. Newton of inventions communicated to him from abroad by M. Nobel. That company had since assigned their business to a new company—Nobel's Explosive Company—who were made co-plaintiffs. This suit related to a patent taken out in 1867 for dynamite. The defendants are manufacturers, at Cologne, of lithofracture, and their agents in England, who have sold that material in this country and also taken steps to set up a manufactory at Purfleet, in Essex. Nitro-glycerine was discovered in the year 1847, which, as is well known, is a very strong, but highly dangerous explosive. It was of no practical use, not only because of the great danger both in storing and carrying the substance, which was liable to explosion from very slight concussion, but also because the nature of the

weight of the nitro-glycerine without danger of exudation. The dynamite of the plaintiffs consists of 75% of nitro-glycerine, and 25% of kieselguhr. The lithofracture of the defendants consists of 55% of glycerine, 21 parts of kieselguhr and the remaining 24 parts of other absorbents, chiefly charcoal, bran, sawdust, sulphur, nitrate of baryta and other substances which have been called semi-explosives. The defendants admitted the usefulness of the plaintiffs' manufacture, though they put in evidence to show that lithofracture was a preferable material, in respect—first, that it did not produce the same disagreeable effluvia on account of more perfect composition, and also that it produced a better fracture for working quarries and mines. They denied the novelty of the invention, in that they alleged that the patent of 1863 was an anticipation of the one under which the plaintiff claimed; they also asserted that the patent was void as being too vaguely expressed, and not sufficiently clear to have enabled an ordinary workman to have made the article patented without experiment. They contended that lithofracture was not within the description; in addition to these objections which the patentees had to surmount, during the hearing an objection was raised by his lordship that the claims might be too wide as extending to the mode of ignition as well as the material. This point was brought out in evidence given by some of the scientific witnesses, which showed that Nobel had in 1864 published a remarkable discovery as to the mode of explosion of some substances produced by a shock instead of a flash, a discovery which has led to the use for explosive purposes of a fulminating cap, as it is called, in opposition to the less powerful ordinary percussion cap. The trial occupied some days, the greater part of the time being occupied in the examination of chemists and other skilled witnesses.

Mr. Aston, Q. C., Mr. Edward Cutler and Mr. Chester appeared for the plaintiffs; Mr. Cotton, Q. C., Mr. Nalder and Mr. Macrory for the defendants.

Specimens of the compounds were produced, but it was not considered that they were so perfectly safe that they might be made exhibits or retained in court, though both substances are licensed under the explosives act, 1875.

Mr. Justice Fry delivered an exhaustive judgment, in which he said that most of the usual objections had been taken against the patentee. It was conceded, however, that the invention was useful, and that the lithofracture had been sold in this country by the defendants. He would deal with the questions of novelty and sufficiency of description. The object of the earlier invention had been quite different from that vested in the plaintiffs. The former had been merely to produce a better explosive, as such to moderate and control the explosive force. That of the latter was to effect safety in storage and carriage. He was of the opinion that the invention was not anticipated. Again, on the evidence he was satisfied that the description was such that any moderately intelligent workman could at the time of the patent have produced from it a dynamite—a good and useful dynamite, though not so valuable as that made now with kieselguhr. But on the question of infringement, he must hold that the defendants did, notwithstanding that they introduced other matters into their manufacture, to some extent make use of the plaintiffs' invention; they did use a non-explosive compound for the purpose of absorbing and changing the nature of the nitro-glycerine, by which it was rendered safe from the danger of being exploded by a slight concussion. With the alleged superiority of the defendants' lithofracture and its freedom from disagreeable effects he had nothing to do. He had further to deal with a question that had been raised on the claim to the mode of ignition. On this he had been satisfied by the evidence that this mode of ignition by fulmination was novel as applied to dynamite; but even had it not been, upon a reasonable construction of the specification, he should hold the reference in the claim was merely for the purpose of illustration. The plaintiffs, therefore, were entitled to an injunction and to have an account of profits. If this became necessary, application could be made for a transfer of the cause that the account might be taken in Chambers.

#### General News Items.

THE Second Regiment Infantry, United States army, under the command of Col. Wheaton, sailed for Portland, en route for the Indian war, in the Oregon steamship, City of Chester.

A new enterprise in the skating line is being inaugurated in this city in the shape of a covered ring, 100 by 250 feet, the floor of which is to be artificial ice, and on which steel skates are to be used.

SIX mills of the American Powder Company at Acton, Massachusetts, exploded in succession on the 24th inst. Carelessness was the cause. One man was killed and nearly a dozen others barely escaped. Loss, \$10,000.

ARRIVALS at Castle Garden are becoming noticeably fewer. The authorities state that the number is even smaller than that of last year. The decrease is owing to had reports of the state of business sent from this country to Europe.

The object of the Newsboys' Union, which was permanently organized last week, is to protect those lads who sell papers for a livelihood from the inroads of those who do so for pocket money, and to provide for the maintenance of the sick and for mutual improvement.

For additional safety the porous substance was to be washed before use in an absorbent with an alkaline substance. The inventor claimed the mode of manufacturing the safety powder, as also the mode of firing the same by special ignition. Dynamite as actually made by the plaintiffs consists of a remarkable siliceous substance, known as kieselguhr and nitro-glycerine. Kieselguhr is an infusorial earth, composed of silica in a porous state, being formed of the minute shells of diatomaceae; it is capable of taking up three times its own



## Barometers in Mines.

The use of barometers and thermometers in mines, is exciting a great deal of attention in mining journals, incidental to the Tynewydd disaster. It seems to be generally admitted that when the barometer falls, the gas has advanced previous to the indications of the instrument. A barometrical fall of the eighth of an inch will at least serve as a warning. A north-country correspondent notes that on the 23th May last, there was a rapid and great fall of the barometer. The result was that a serious explosion of gas occurred in a lead mine near Hexham, and about the same hour a man was killed at Nantyglo by an explosion. This is at least a suggestive coincidence. As a general remedy against mining disasters from overcharged gases, a Yarmouth correspondent of a contemporary (Mr. C. Colwell) says: "As regards Hartley and Tynewydd, I maintain that with compressed air in either to the extent which I produced at Scottswood, the 204 victims in the former, and all in the latter, would have been saved. As every effort to pump the water out of the Welsh pit failed, I may ask why no attempt was made to combat this difficulty by natural laws? The application of air to compression in the inundated pit, or by exhausting it from the old workings, the water must have receded, so that every-one apparently entombed might have walked in safety to the shaft; as it was, however, poor Morgan fell a victim to the sudden escape of the pent-up atmosphere, and then my proposition as to the mode of dealing with pit air under compression was resorted to, and the next batch of our fellow creatures was saved." The subject is one of immense interest to South Wales, and a vigorous discussion cannot but add to existing information.—*South Wales Daily News.*

**TREATING COPPER.**—With a view to communicate great hardness, toughness, and homogeneity to copper and alloys of copper, so as better to fit them for certain industrial uses, Mr. W. E. Everitt, of Birmingham, takes oxides of manganese, preferably the native ore commonly known as the black oxide of manganese, in a state of fine powder, and in the proportion of from one to six parts by weight of the said oxide of manganese to 100 parts by weight of the copper to be operated upon. He puts the copper and oxide of manganese together into the melting pot or furnace, and when the copper is melted stirs the oxide of manganese well into it. As soon as the dross and scum have thoroughly separated from and risen to the surface of the melted metal, the copper or alloy is ready to be poured into ingot or other molds. In treating brass he proceeds as described with respect to copper, adding the required percentage of zinc to the melted copper. The alloys of copper to which the invention is especially applicable are alloys of copper and zinc, but he does not limit himself thereto, as his invention is also applicable to other alloys of which the essential metal is copper. Besides rendering copper and alloys of copper tougher, harder, and more homogeneous, the treatment described facilitates the rolling of alloys of copper at a red heat, and thereby effects an economy of time and labor in the rolling process. Copper and brass treated according to the invention are admirably fitted for the manufacture of steam-boiler tubes, bearing for shafts or axles, axle boxes, sheathing for ships, and bolts and nails for the same, as well as for sheet brass and brass wire. Although in practice he has found the native black oxide of manganese to answer well, yet he does not limit himself to the use of that particular compound of manganese, as other oxides of that metal, or compounds which on being heated yield oxide of manganese, may be employed with like results.

**RED-LEAD FURNACES.**—By the invention of Wm. Lang, Jr., of Glasgow, the lead is prevented from finding its way into the mass of brickwork. The beds of furnaces hitherto adopted being of solid brickwork, the lead has to saturate more or less this brickwork before a working furnace is obtained. Mr. Lang's improvements consist in making an iron sole, preferably in two pieces, of a shape similar to a trapezoid, or four-sided figure, having two of its opposite sides parallel. It is made of cast-iron or wrought-iron, and has flanges on all sides. The sole rests on butts of brickwork, and the surface is filled in with best fire-bricks to form the bed of the furnace. The other parts of the furnace are similar in construction to the furnaces or ovens at present in general use. The working of the new furnace does not involve any new process. The essential feature of the invention consists in the peculiarity of making the sole of the furnace of a cast-iron plate lined with brickwork, though for the sake of getting a better casting he casts the plate in two pieces, and then joins together with bolts and nuts; the same may be made in one piece, or can be made up of more than two pieces.

**WHY CAN'T IT BE FOUND?**—Several years ago a miner, while prospecting on Mill creek, came across a detached boulder, or rather a detached mass of hard, white quartz, which had rolled down the mountain and lodged on the point between the forks of the creek. In some parts of the quartz gold was visible, and by crushing it in a mortar a very rich prospect could be obtained. For a short time there was some excitement regarding it and quite a rush up that way, but the quartz bunters soon gave up the chase and the ledge has never been found. The

boulder is there yet, or what is left after the numerous "chippings" it has been subjected to, and any one wishing to take a look for the ledge can "take his bearings" from it. That the ledge is a very rich one, no one who prospects the rock will deny, and it seems as though it could be found with a little patient labor. Take a chance and see if you can't become a millionaire by bringing to light the "Mill creek bonanza."—*Plumas National.*

We are informed that the Lucas Sleeping Car Company have adopted an ingenious invention, just patented by Mr. C. E. Lucas, Atlanta, Ga., which promises additional comfort to sleeping-car travelers in cold weather. The invention consists in providing the wash-room of a sleeping-car or parlor railway car with a washstand composed of a double or two tanks, with a basin interposed between them, with pumps, one of the tanks being furnished with a coil of steam tubing connected with the main steam pipes by which the car is warmed; the object being to provide a supply of warm water for toilet purposes, and prevent the freezing of the water in the toilet tanks and pipes thereof during cold weather, an accident which frequently occurs with the common apparatus, and causes injury, inconvenience and discomfort. The advantage to the traveler, especially to ladies, children and invalids, of a constant supply of warm water for toilet use, needs only to be suggested to be appreciated.—*Railway Age.*

**MASSACHUSETTS HILL MINES.**—The Gold Hill mine, the oldest in this district, is starting up again, says the Grass Valley Union, after years of idleness. This ought to cause Massachusetts Hill to be put in working condition. We understand that parties interested in the Massachusetts Hill properties have lately held a meeting, and that a disposition to resume work there was strongly manifested. Starting up the Massachusetts Hill mines would be of incalculable advantage to the business and prosperity of this town, and will result in great gain to the owners of those mines. If any scheme for the resumption of work on that old and known to be rich hill is inaugurated, every one interested in the town or its business should lend a helping hand, if need be, in the matter.

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Our long experience in obtaining patents for Inventors on this Coast has familiarized us with the character of most of the inventions already patented; hence we are frequently able to save our patrons the cost of a fruitless application by pointing to them the same thing already covered by a patent. We are always free to advise applicants of any knowledge we have of previous applicants which will interfere with their obtaining a patent.

We invite the acquaintance of all parties connected with inventions and patent right business, believing that the mutual conference of legitimate business and professional men is mutual gain. Parties in doubt in regard to their rights as assignees of patents or purchasers of patented articles, can often receive advice of importance to them from a short call at our office.

Remittances of money, made by individual inventors to the Government, sometimes miscarry, and it has repeatedly happened that applicants have not only lost their money, but their inventions also, from this cause and consequent delay. We hold ourselves responsible for all fees entrusted to our agency.

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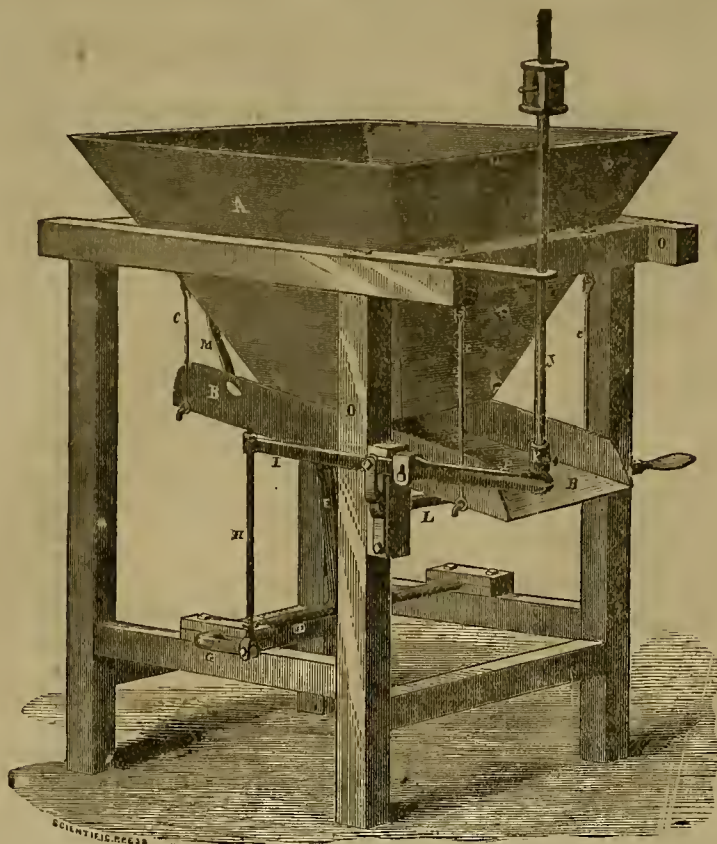
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(Continued from page 53.)

shaft is down 100 feet in good ore. Two drifts are run in a short distance north and south from the bottom of the shaft. Five tons of assorted ore, recently shipped to San Francisco, yielded \$1,000 per ton. North of the shaft, a tunnel run in on the ledge 60 feet shows good ore. In the shaft is a two foot vein of ore that will work, without sorting, \$250 per ton. There are now on the dump from the shaft and tunnel, 40 tons of this kind of ore. Altogether ten tons of ore have been shipped from this spur to San Francisco. It averaged \$1,000 per ton; some of it yielded over \$2,000 per ton.

**TIGER DISTRICT.**—The mill recently erected in Bradshaw basin is one of the finest in the Territory. It consists of 10 750-lb. stamps, two pans of a capacity of 3,000 lbs. and one settler. The engine, 60-horse power, is claimed to be the best in the Territory. A roaster has been ordered, and will be on the ground and ready to put up about the 1st of September. There are 64 men at work in and about the mill and mine.

The Gretna, bearing silver, is considered one of the best mines owned by the Bradshaw & M. Co., and 15 men are at work on it. They are taking out some very fine silver ore, though we fear the ore is not worked as close as it should be, as we saw considerable apparently barren rock on the dump awaiting shipment to the mill. The owners of the mine will do well to remember that the reputations of many mines have been ruined by working everything between the walls.

We saw some very rich ore from the Mazepa, a new location, situated about one mile and a half southeast of the mill, and owned by Mr. Donahue. A force of six men are at work on this mine, which shows an 8-inch streak of ore that will work \$300 to the ton.

On the Eclipse, one mile and a half from the mill, five men are at work. At a depth of 20 feet it shows a two-foot vein, which will mill \$75 per ton. It is the intention of the company to keep on sinking on this ledge.

The Lorca, running parallel with the Eclipse, is also yielding very good ore. The discovery claim on this ledge is owned by the company. They have run an open cut along the ledge, and have already out 15 tons of ore that will work \$250 per ton. The pay streak is 15 inches in width.

The California, half a mile north of the discovery location on the Tiger, has a 62-foot shaft. There are also several cuts run along the ledge, prospecting it for a distance of 1,000 feet. Seven hundred tons of ore on the dump will work \$70 per ton. Assays along the entire length of the claim went \$200 per ton.

**ARIZONA CITIZEN.** July 14: Work is progressing on the Aztec mine. It is located in very rough mountains, and considerable labor has been required to build a road by which to transport supplies and materials to Camp Toltec—the Aztec camp. Manager Magee returned from the works early this week, and says the prospects are all he could wish.

**ORO BLANCO.**—A. C. Benedict was lately out in Oro Blanco district, where Messrs. Kirkpatrick, Flood and others are at work. All feel confident that a few months will prove the high value placed upon their mines. Mr. Flood said to Benedict: We are not saying much, but within three months we will have works under way and there will be no failure. Reports from the Santa Rita section are favorable.

## PATENTS AND INVENTIONS.

### A Weekly List of U. S. Patents Issued to Pacific Coast Inventors.

[FROM OFFICIAL REPORTS FOR THE MINING AND SCIENTIFIC PRESS, DEWEY & CO., PUBLISHERS AND U. S. AND FOREIGN PATENT AGENTS.]

By Special Dispatch, Dated Washington, D. C., July 24th, 1877.

WEEK ENDING JULY 20, 1877.

- 192,567. ORE STAMPS.—Thomas A. Cochrane, S. F.  
192,595. AQUARIUMS.—Matthew Palen and Daniel Sexton, S. F.  
192,610. COAL ELEVATORS.—John A. Woodward, S. F.  
192,611. GRAIN ELEVATORS.—John A. Woodward, S. F.  
192,663. WINDMILLS.—William G. Alexander, Winnebago, Nev.  
192,743. SOLDERING TOOLS.—Lewis Cutting, S. F.  
7,781. PISTON PACKING.—Andrew J. Stevens, Sacramento, Cal.  
10,085. LIQUOR FLASKS.—Ernest R. Lilienthal, S. F.

WEEK ENDING JULY 10TH.

- 192,904. IMPROVEMENT IN GRIPPING DEVICES FOR ROPE TRANWAYS.—Thos. H. Day, S. F.  
192,915. IMPROVEMENT IN CAR COUPLING.—Floyd Heavener, Laramie City, Wyoming Terr.  
192,933. WINDMILLS.—James P. Preston, Gold Run, Cal.  
193,021. MILL PICKS.—William B. Morris, Collinsville, Cal.  
193,030. PAN ANALYZERS.—Almarin B. Paul, S. F.  
193,051. WOOD PAVEMENT.—Henry M. Stow, S. F.  
7,794. SELF DISCHARGING PULVERIZING BARREL FOR ORES.—Almarin B. Paul, S. F.  
TRADE MARKS.  
4,847. NEW YORK REFINED PETROLEUM.—Haas Brothers, S. F. and New York.  
4,858. OILS.—Wellman, Peck & Co., S. F.  
4,900. TEA.—Haas Brothers, S. F. and New York.  
4,901. YEAST POWDER.—Haas Brothers, S. F. and N. Y.  
4,902. TEA.—Haas Brothers, S. F. and New York.

### Signal Service Meteorological Report.

Week Ending July 24, 1877.

HIGHEST AND LOWEST BAROMETER.						
July 18	July 19	July 20	July 21	July 22	July 23	July 24
29.07	29.37	29.33	29.01	29.94	29.93	29.84
29.86	29.84	29.83	29.86	29.35	29.32	29.82
MINIMUM AND MAXIMUM THERMOMETER.						
69	64	63	65	68	65	60
56	55	54	50	54	54	53
MEAN DAILY HUMIDITY.						
73	83	75	74	72	79	74
PREVAILING WIND.						
W	SW	SW	SWW	WSW	WSW	SW
WIND—MILES TRAVELED.						
362	823	331	267	268	322	328
STATE OF WEATHER.						
Clear.	Fair.	Fair.	Clear.	Clear.	Clear.	Clear.
RAINFALL IN TWENTY-FOUR HOURS.						
Total rain during the season, from July 1, 1877, 0.02 in.						

WOODWARD'S GARDENS has the following new attractions: The buffalo chase; large whale skeleton; new museum; improvements in the zoological department, besides the other features which have made it popular.

Dewey & Co. { 202 Sansome St. } Patent Ag'ts.

## METALS.

WHOLESALE.

THURSDAY, M., July 26, 1877.

IRON.			
American Pig, ton	28 00	@ 32 00	
Scotch Pig, ton	32 00	@ 33 00	
White Pig, ton	28 00	@ —	
Oregon Pig, ton	—	@ —	
Refined Bar	—	@ 31 00	6 1/2
Horse Shoes, keg	5 00	@ —	
Nail Rod	—	@ 7 1/2	
Norway, Oval	—	@ 7 1/2	
Roller	—	@ —	
COPPER.			
Copper Tinned	37 00	@ 40	
Sheathing, lb	37 00	@ 40	
Sheathing, Yellow	21 00	@ 22 1/2	
Sheathing, Old Yellow	19 00	@ 21	
Composition Nails	21 00	@ —	
Composition Bolts	24 00	@ —	
STEEL.			
English Cast, lb	14 00	@ 25	
Anderson & Woods, ordinary	16 00	@ —	
Drill	18 00	@ —	
Flat Bar	15 00	@ 18	
Plow Steel	8 1/2	@ 12 1/2	
TIN PLATES.			
10x14 I C Charcoal	8 50	@ 9 00	
Banca Tin	24 00	@ —	
Australian	19 00	@ 20	
ZINC.			
By the Cask	11 00	@ —	
Zinc Sheet 7x3 ft, 7 to 10, lb	11 00	@ —	
7x3 ft, 11 to 14	11 00	@ —	
8x4 ft, 8 to 10	12 00	@ —	
8x4 ft, 11 to 10	12 00	@ —	
NAILS.			
Assorted sizes	3 00	@ 3 25	
QUICKSILVER.	—	@ 43 00	
By the lb	—	@ —	

## LEATHER.

[WHOLESALE.]

WEDNESDAY M., July 25, 1877.

Sole Leather, heavy, lb.			
Light	26 00	@ 29	
Jordot, 8 Kil, doz	43 00	@ 50 00	
11 to 13 Kil	58 00	@ 70 00	
14 to 15 Kil	52 00	@ 64 00	
Second Choice, 11 to 16 Kil	57 00	@ 74 00	
Cornellian, 12 to 16 Kil	57 00	@ 67 00	
Females, 12 to 13 Kil	53 00	@ 67 00	
14 to 16 Kil	71 00	@ 67 50	
Simon Ulmo, Females, 12 to 13 Kil	58 00	@ 67 00	
14 to 15 Kil	66 00	@ 70 00	
16 to 17 Kil	72 00	@ 74 00	
Simon, 18 Kil	61 00	@ 63 00	
20 Kil	65 00	@ 67 00	
24 Kil	72 00	@ 74 00	
Robert Calif, 7 and 9 Kil	35 00	@ 40 00	
Kipsa, French, lb	1 00	@ 1 35	
Cal, doz	40 00	@ 70 00	
French Sheep, all colors	8 00	@ 15 00	
Eastern Cal for Backs, lb	1 00	@ 1 25	
Sheep Roans for Topping, all colors, doz	9 00	@ 13 00	
For Lining	5 00	@ 10 50	
Cal, Russet Sheep Lining	1 75	@ 4 50	
Boot Lega, French Cal, pair	4 00	@ —	
Good French Cal	4 00	@ 4 75	
Best Joliet Cal	5 00	@ 5 25	
Leather, Harness, lb	35 00	@ 38	
Fair Bridle, doz	43 00	@ 72 00	
Skirting, lb	33 00	@ 37	
Welt, doz	30 00	@ 50 00	
Buff, lb	18 00	@ 20	
Wax Side	17 00	@ 20	

## Gold, Legal Tenders, Exchange, Etc.

[Corrected Weekly by SUTRO & Co.]

LEGAL TENDERS in S. F., 11 A. M., 25. SILVER, 57 @ 66  
GOLD in New York, 105 1/2  
GOLD BARS, 880 @ 890. SILVER BARS, 10 @ 15 1/2 cent. discount.  
EXCHANGE on New York, 1/2 % on London bankers, 4 1/2 %; Commercial, 4 1/2 %; Paris, 5 francs 3/4 dollar; Mexican dollars, 94 @ 95.  
LONDON Consols, 94 1/2; Bonds, 107 1/2.  
QUICKSILVER in S. F., by the flask, 3 1/2 lb, 42 @ 42 1/2.

## PACIFIC LAMP & REFLECTOR FACTORY



Hall and Show Window Reflectors of Corrugated Tin and Silvered Corrugated Glass, Sectional Globe and any Style of Ornamental Lamps for Hotels, Private Residences, Churches, Etc. Ship, Railroad, Street, Car, Coach, Mill and Mining Lamps and Reflectors of various patterns and sizes.  
SPINNING OF SHEET METAL TO ORDER.  
Send for further information. Machinery is run by Steam.

## WATER! WATER!

For Irrigation, For Mines, For Cities and Towns, For Houses, Factories, For any Purpose.

The Cheapest and the best Pipe in the World. Easily laid, easily tapped—practically imperishable. Anybody and everybody wanting the only really common sense

## WATER PIPE MANUFACTURED,

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"More than Pleased."

OSCEOLA MINE, NEVADA CO., CAL., April 19th, 1877.  
Messrs. Dewey & Co.—Gentlemen:—We are more than pleased with your professional ability in the management of our application, and will always recommend your competency as Patent Attorneys, and your honorable and gentlemanly dealings with clients. Truly and respectfully yours,  
LOUIS R. TULLOCH.  
THOMAS D. TULLOCH.

# The Mechanics' Fair Daily.

By authority of the MECHANICS' INSTITUTE, OF THE CITY OF SAN FRANCISCO, the publishers of the MINING AND SCIENTIFIC PRESS will issue a large edition of the EIGHTH VOLUME of the MECHANICS' FAIR DAILY during the TWELFTH INDUSTRIAL EXHIBITION.

It will be of large size, printed and circulated FREE in the Pavilion, and contain the day and evening programme, and official bulletin of the Institute.

Its columns will embrace a large variety of important industrial and scientific information, illustrations and well written descriptions of the general features and most deserving and novel exhibits in the Fair, a record of the Fair and incidents of its daily progress—gay, serious and comic—as they occur.

The best of editorial, reportorial and corresponding talent will be employed, with a view to make the paper of live interest in all its departments and of standard value as a full record of the great exhibition, the wonderful inventions, rich resources and rapid progress of our great Western community.

Doubtless more than ONE HUNDRED THOUSAND different individuals will receive copies of our paper during the Fair. The fair character of the journal—the specially attractive features of its free issue in the Pavilion, and its absorbing interest to visitors at the Fair, the attention its columns command when brought into the shop and family circle by those who receive it freely at the Fair, make the paper a powerful advertising medium.

The managers have granted us the exclusive advertising and printing privileges and will receive no advertising in the official catalogue and reports.

Our previous volumes have met with unrivaled success and gratifying results to advertisers, nearly all of whom were leading and first class business firms.

Many thousands of marked copies were sent by mail and otherwise to friends near and distant, giving the FAIR DAILY a more broadcast and universal circulation than any other newspaper published.

Its columns are more closely examined throughout than those of any ordinary publication.

By past experience, ample facilities, and a fair reputation of doing business in our line, we expect, with the reasonable support of all naturally interested in the success of our enterprise, to make the coming volume superior to its predecessors, and eminently satisfactory to the Institute, to our patrons and to the general public, who are more or less benefited by such an advocate of the substantial advancement of the grand and worthy industries of our Coast.

DEWEY & CO., Publishers.

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15 Astor Place, New York.

STOCKTON, July 2, 1877.

MESSRS. DEWEY & CO.—Gentlemen:—My letters patent were received in due time. Thanking you for faithful service, promptness in replying to my letters, etc., I am most respectfully, your obedient servant,  
C. H. COVELL.





**TARRANT'S**  
**SELTZER**  
**WATER**

Violent Purgation is Obsolete. To assist, not to attack nature, is the true medical philosophy, and TARRANT'S EFFERVESCENT SELTZER WATER, by gently urging the torpid excretive and discharging organs to perform their functions, quickly and painlessly works the most extraordinary cures. Sold everywhere.

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**BRASS and BELL FOUNDRY**  
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MANUFACTURER AND IMPORTER OF  
Church and Steamboat BELLS and GONGS,  
BRASS CASTINGS of all kinds,  
WATER GATES, GAS GATES,  
FIRE HYDRANTS,  
DOCK HYDRANTS,  
GARDEN HYDRANTS

A General Assortment of Engineers' Findings.



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The Best and Most  
Durable in use. Also,  
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**PUMPS**

For Mining and Farming Purposes.

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For Ventilating Mines and for Smelting Works.  
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**PAT. SEPT. 10TH 1861**

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CONSULTING ENGINEER, EXAMINER OF MINES  
MINERAL ASSAYER & METALLURGIST.

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**CHARGES FOR ASSAYING.**—Gold and Silver, \$5;  
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Qualitative or Quantitative Analysis of Ores, \$10 or 25;  
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**Mining and Other Companies.**

Persons interested in incorporated shares  
will do well to recommend the publication  
of the official notices of their companies  
in this paper, as the cheapest appropriate  
medium for the same.

**Bella Union Quicksilver Mining Company.**

Location of principal place of business, San Francisco, California. Location of works, Napa County, California.  
Notice is hereby given that at a meeting of the Board of Directors, held on the twenty-eighth day of June, 1877, an assessment (No. 2), of ten cents per share was levied upon the capital stock of the corporation, payable immediately in U. S. gold coin, to the Secretary, at the office of the company, No. 312 Montgomery Street, San Francisco, Cal.  
Any stock upon which this assessment shall remain unpaid on the thirtieth day of July, 1877, will be delinquent, and advertised for sale at public auction, and unless payment is made before, will be sold on Monday, the twenty-fifth day of August, 1877, to pay the delinquent assessment, together with costs of advertising and expenses of sale. By order of the Board of Directors. ABRAHAM HALSEY, Secy.  
Office, No. 312 Montgomery Street, San Francisco, Cal.

**California Fruit Growing Association.**

Principal place of business, San Francisco. Location of property, El Dorado county, Cal.  
Notice is hereby given, that at a meeting of the Board of Directors, held on the second day of July, 1877, an assessment of \$1.50 per share was levied upon the capital stock of the corporation, payable immediately in U. S. gold coin, to the Secretary, at the office of the company, No. 402 Montgomery Street, San Francisco, California.  
Any stock upon which this assessment shall remain unpaid on the twenty-fifth day of August, 1877, will be delinquent, and unless payment is made before, will be sold on Monday, the thirtieth day of September, 1877, to pay the delinquent assessment, together with costs of advertising and expenses of sale. By order of the Board of Directors. O. H. BART, Secretary.  
Office, Room 1, No. 402 Montgomery Street, San Francisco, California.

the corporation, payable immediately in U. S. gold coin, to the Secretary, at 313 Montgomery Street, San Francisco, California.  
Any stock upon which this assessment shall remain unpaid on the sixth day of August, 1877, will be delinquent, and advertised for sale at public auction, and unless payment is made before, will be sold on Monday, the twentieth day of August, 1877, to pay the delinquent assessment, together with costs of advertising and expenses of sale.  
HORACE JONES, Secy.  
Office, 331 Sansome Street.

**Cherokee Flat Blue Gravel Company.**

Location of principal place of business, San Francisco, California. Location of works, Cherokee, Butte County, California.  
Notice is hereby given that at a meeting of the Board of Directors, held on the nineteenth day of July, 1877, an assessment (No. 38, of five cents per share) was levied upon the capital stock of the corporation, payable immediately in U. S. gold coin, to the Secretary, at the office of the company, Room 1, No. 402 Montgomery Street, San Francisco, California.  
Any stock upon which this assessment shall remain unpaid on the twenty-fifth day of August, 1877, will be delinquent and advertised for sale at public auction, and unless payment is made before, will be sold on Monday, the seventh day of September, 1877, to pay the delinquent assessment, together with costs of advertising and expenses of sale. By order of Board of Directors.  
O. H. BART, Secretary.  
Office—Room 1, No. 402 Montgomery Street, San Francisco, California.

**Consolidated Bonanza Gold and Silver Mining Company.**

Location of principal place of business, San Francisco, California. Location of works, in Eagle and Washoe Valley Mining District, Ormsby County, Nevada.  
Notice—There is delinquent upon the following described stock, on account of assessment No. 1, levied on the fourth day of June, 1877, the several amounts set opposite the names of the respective shareholders as follows:  

Name.	No. Certificate.	No. Shares.	Amount.
Hobbs, C. S.	1	100	10 00
Hobbs, J. K. C.	2	50	5 00
Carpenter, D. A.	5	50	5 00
Hobbs, C. S., Trustee	8	500	50 00
Hobbs, C. S., Trustee	8	2500	250 00
Hobbs, C. S., Trustee	11	5	50
Hobbs, C. S., Trustee	12	20	2 00
Hobbs, C. S., Trustee	15	100	10 00
Hobbs, C. S., Trustee	18	1000	100 00
Hobbs, C. S., Trustee	19	100	10 00
Hobbs, C. S., Trustee	20	300	30 00
Hobbs, C. S., Trustee	21	200	20 00
Hobbs, C. S., Trustee	22	1000	100 00
Hobbs, C. S., Trustee	23	9250	925 00
Hobbs, C. S., Trustee	24	25	2 50
Hobbs, C. S., Trustee	27	25	2 50
Hobbs, C. S., Trustee	28	250	25 00
Hobbs, C. S., Trustee	30	50	5 00
Hobbs, C. S., Trustee	31	200	20 00
Hobbs, C. S., Trustee	34	55	5 50

  
And in accordance with law and an order of the Board of Trustees, made on the fourth day of June, 1877, so many shares of each parcel of such stock as may be necessary will be sold at public auction, at the office of the company, No. 10 First Street, San Francisco, California, on Tuesday, the thirty-first day of July, 1877, at the hour of 3 o'clock p. m., of said day, to pay said delinquent assessment thereon, together with costs of advertising and expenses of sale.  
WM. MARTIN, Secy.  
Office, No. 10 First Street, San Francisco, Cal.

**Excelsior Silver Mining Company.**

Location of principal place of business, San Francisco, California. Location of works, Potosi District, Lincoln County, Nevada.  
Notice is hereby given that at a meeting of the Board of Directors, held on the tenth day of July, 1877, an assessment of ten cents per share was levied upon the capital stock of the corporation, payable immediately in U. S. gold and silver coin, to the Secretary, at the office of the company, 305 Post Street, San Francisco, Cal.  
Any stock upon which this assessment shall remain unpaid on the tenth day of August, 1877, will be delinquent and advertised for sale at public auction, and unless payment is made before, will be sold on Monday, the twenty-seventh day of August, 1877, to pay the delinquent assessment, together with costs of advertising and expenses of sale.  
W. A. KOLLMYER, Secy.  
Office, 305 Post Street, San Francisco.

**Mariposa Land and Mining Company of California.**

Location of principal place of business, San Francisco, California. Location of works, Mariposa County, California.  
Notice—There is delinquent upon the following described stock, on account of assessment, No. 11, levied on the sixth day of June, 1877, the several amounts set opposite the names of the respective shareholders, as follows:  

Name.	No. Certificate.	No. Shares.	Amount.
Adams, Thomas.	1164	50	\$100 00
Adams, Thomas.	A 3	50	50 00
Ambleman, Edgar M.	1400	100	100 00
Ambleman, Edgar M.	1528	100	100 00
Ambleman, Edgar M.	1602	100	100 00
Ambleman, Edgar M.	1634	100	100 00
Ambleman, Edgar M.	1635	100	100 00
Ambleman, Edgar M.	1636	100	100 00
Ambleman, Edgar M.	1637	100	100 00
Ambleman, Edgar M.	1638	100	100 00
Brumagin, J. H.	1117	100	100 00
Brumagin, J. H.	1118	100	100 00
Brumagin, J. H.	1119	100	100 00
Brumagin, J. H.	1351	100	100 00
Brumagin, J. H.	1352	100	100 00
Brumagin, J. H.	1353	100	100 00
Brumagin, J. H.	1354	100	100 00
Brumagin, J. H.	1355	100	100 00
Brumagin, J. H.	1356	100	100 00
Brumagin, J. H.	1357	100	100 00
Brumagin, J. H.	1358	100	100 00
Brumagin, J. H.	1359	100	100 00
Brumagin, J. H.	1360	100	100 00
Brumagin, J. H.	1361	100	100 00
Brumagin, J. H.	1362	100	100 00
Brumagin, J. H.	1363	100	100 00
Brumagin, J. H.	1364	100	100 00
Brumagin, J. H.	1365	100	100 00
Brumagin, J. H.	1366	100	100 00
Brumagin, J. H.	1367	100	100 00
Brumagin, J. H.	1368	100	100 00
Brumagin, J. H.	1369	100	100 00
Brumagin, J. H.	1370	100	100 00
Brumagin, J. H.	1371	100	100 00
Brumagin, J. H.	1372	100	100 00
Brumagin, J. H.	1373	100	100 00
Brumagin, J. H.	1374	100	100 00
Brumagin, J. H.	1375	100	100 00
Brumagin, J. H.	1376	100	100 00
Brumagin, J. H.	1377	100	100 00
Brumagin, J. H.	1378	100	100 00
Brumagin, J. H.	1379	100	100 00
Brumagin, J. H.	1380	100	100 00
Brumagin, J. H.	1381	100	100 00
Brumagin, J. H.	1382	100	100 00
Brumagin, J. H.	1383	100	100 00
Brumagin, J. H.	1384	100	100 00
Brumagin, J. H.	1385	100	100 00
Brumagin, J. H.	1386	100	100 00
Brumagin, J. H.	1387	100	100 00
Brumagin, J. H.	1388	100	100 00
Brumagin, J. H.	1389	100	100 00
Brumagin, J. H.	1390	100	100 00
Brumagin, J. H.	1391	100	100 00
Brumagin, J. H.	1392	100	100 00
Brumagin, J. H.	1393	100	100 00
Brumagin, J. H.	1394	100	100 00
Brumagin, J. H.	1395	100	100 00
Brumagin, J. H.	1396	100	100 00
Brumagin, J. H.	1397	100	100 00
Brumagin, J. H.	1398	100	100 00
Brumagin, J. H.	1399	100	100 00
Brumagin, J. H.	1400	100	100 00
Brumagin, J. H.	1401	100	100 00
Brumagin, J. H.	1402	100	100 00
Brumagin, J. H.	1403	100	100 00
Brumagin, J. H.	1404	100	100 00
Brumagin, J. H.	1405	100	100 00
Brumagin, J. H.	1406	100	100 00
Brumagin, J. H.	1407	100	100 00
Brumagin, J. H.	1408	100	100 00
Brumagin, J. H.	1409	100	100 00
Brumagin, J. H.	1410	100	100 00
Brumagin, J. H.	1411	100	100 00
Brumagin, J. H.	1412	100	100 00
Brumagin, J. H.	1413	100	100 00
Brumagin, J. H.	1414	100	100 00
Brumagin, J. H.	1415	100	100 00
Brumagin, J. H.	1416	100	100 00
Brumagin, J. H.	1417	100	100 00
Brumagin, J. H.	1418	100	100 00
Brumagin, J. H.	1419	100	100 00
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Brumagin, J. H.	1421	100	100 00
Brumagin, J. H.	1422	100	100 00
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Brumagin, J. H.	1424	100	100 00
Brumagin, J. H.	1425	100	100 00
Brumagin, J. H.	1426	100	100 00
Brumagin, J. H.	1427	100	100 00
Brumagin, J. H.	1428	100	100 00
Brumagin, J. H.	1429	100	100 00
Brumagin, J. H.	1430	100	100 00
Brumagin, J. H.	1431	100	100 00
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Brumagin, J. H.	1439	100	100 00
Brumagin, J. H.	1440	100	100 00
Brumagin, J. H.	1441	100	100 00
Brumagin, J. H.	1442	100	100 00
Brumagin, J. H.	1443	100	100 00
Brumagin, J. H.	1444	100	100 00
Brumagin, J. H.	1445	100	100 00
Brumagin, J. H.	1446	100	100 00
Brumagin, J. H.	1447	100	100 00
Brumagin, J. H.	1448	100	100 00
Brumagin, J. H.	1449	100	100 00
Brumagin, J. H.	1450	100	100 00
Brumagin, J. H.	1451	100	100 00
Brumagin, J. H.	1452	100	100 00
Brumagin, J. H.	1453	100	100 00
Brumagin, J. H.	1454	100	100 00
Brumagin, J. H.	1455	100	100 00
Brumagin, J. H.	1456	100	100 00
Brumagin, J. H.	1457	100	100 00
Brumagin, J. H.	1458	100	100 00
Brumagin, J. H.	1459	100	100 00
Brumagin, J. H.	1460	100	100 00
Brumagin, J. H.	1461	100	100 00
Brumagin, J. H.	1462	100	100 00
Brumagin, J. H.	1463	100	100 00
Brumagin, J. H.	1464	100	100 00
Brumagin, J. H.	1465	100	100 00
Brumagin, J. H.	1466	100	100 00
Brumagin, J. H.	1467	100	100 00
Brumagin, J. H.	1468	100	100 00
Brumagin, J. H.	1469	100	100 00
Brumagin, J. H.	1470	100	100 00
Brumagin, J. H.	1471	100	100 00
Brumagin, J. H.	1472	100	100 00
Brumagin, J. H.	1473	100	100 00
Brumagin, J. H.	1474	100	100 00
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Brumagin, J. H.	1498	100	100 00
Brumagin, J. H.	1499	100	100 00
Brumagin, J. H.	1500	100	100 00
Brumagin, J. H.	1501	100	100 00
Brumagin, J. H.	1502	100	100 00
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Brumagin, J. H.	1511	100	100 00
Brumagin, J. H.	1512	100	100 00
Brumagin, J. H.	1513	100	100 00
Brumagin, J. H.	1514	100	100 00
Brumagin, J. H.	1515	100	100 00
Brumagin, J. H.	1516	100	100 00
Brumagin, J. H.	1517	100	100 00
Brumagin, J. H.	1518	100	100 00
Brumagin, J. H.	1519	100	100 00
Brumagin, J. H.	1520	100	100 00
Brumagin, J. H.	1521	100	100 00
Brumagin, J. H.	1522	100	100 00



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### PACIFIC ROLLING MILL COMPANY,

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Established for the Manufacture of  
RAILROAD AND OTHER IRON  
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Every Variety of Shafting,  
Embracing ALL SIZES of  
Steamboat Shafts, Cranks, Piston and Connecting Rods, Car and Locomotive Axles and Frames,  
—ALSO—  
Hammered Iron of Every Description and Size.  
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The highest price paid for Scrap Iron.

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CAPITAL.....\$1,000,000.  
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Manufacturers of Steam Engines, Quartz and Flour Mill Machinery, Steam Boilers (Marine, Locomotive and Stationary), Marine Engines (High and Low Pressure). All kinds of light and heavy Castings at lowest prices. Cans and Tappets, with chilled faces, guaranteed 40 per cent. more durable than ordinary iron.

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MANUFACTURERS OF

IRON CASTINGS  
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OF ALL KINDS.  
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37 Fremont St., cor. Mission, S. F.

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PRACTICAL BOILER MAKERS,

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ALL KINDS OF SHEET IRON WORK.  
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Of all sizes—from 2 to 60-Horse power. Also, Quartz Mills, Mining Pumps, Hoisting Machinery, Shafting, Iron Tanks, etc., For sale at the lowest prices by  
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Miners' Foundry and Machine Works,  
CO-OPERATIVE,  
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### Machinery and Castings of all kinds.

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BOILER MAKERS AND  
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Howard between Fremont and Beale Sts., San Francisco

## PACIFIC IRON WORKS,

First and Fremont Streets, between Mission and Howard, San Francisco, Cal.,  
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ENGINES, BOILERS, MARINE AND STATIONARY. PUMPING, HOISTING AND MINING MACHINERY, INCLUDING BATTERIES, AMALGAMATING PANS AND SETTLERS, CONCENTRATORS, ORE FEEDERS, CRUSHING ROLLS AND ROCK BREAKERS, ALSO, WATER JACKET SMELTING FURNACES, FOR REDUCING LEAD, SILVER AND COPPER ORES, QUICKSILVER FURNACES, RETORTS AND CONDENSERS, ROASTING AND CHLORIDIZING FURNACES, SUGAR MILL MACHINERY, WATER WHEELS, Etc., ALL OF THE LATEST AND MOST IMPROVED CONSTRUCTION.

Agents for the Allen Engine Governor, Cook's Boiler Feeder and Heater, Buckminster Rock Drills and Air Compressors, Wheeler's Ore Breaker, Etc.

GEO. W. FOGG, Supt.

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ALL STYLES OF FANCY HEAD BOLTS. HOT AND COLD PRESSED HEXAGONAL AND SQUARE NUTS, WASHERS, BOLT ENDS, TURNBUCKLES, ETC., ETC.

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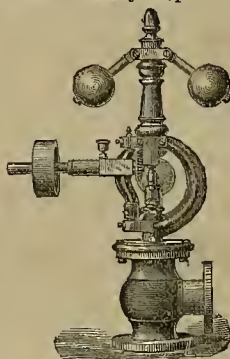


Is Extensively Used in the East and

TAKES THE PLACE OF ALL OTHERS, Wherever introduced, because it can be run with less power, labor and repairs, and do more work than any other Drill in the market. It has but few parts, is easily handled, being light, and has AUTOMATIC FEED, which saves labor. WE ASK FOR TRIAL AGAINST ANY COMPETITOR. For particular information regarding Drills or Air Compressors, send for circular to  
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MORE THAN TEN THOUSAND NOW IN USE.  
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Guaranteed to Chloridize from 85 to 95 per cent. of any gold or silver ores that are not more profitable for smelting. Will also desulphurize ores and put them in proper shape for working in cupola furnaces.

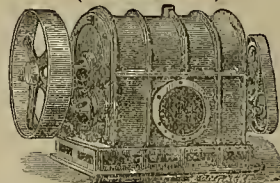
Cost of Roasting and Chloridizing 20 Tons in 24 Hours by this Process:  
One man.....\$ 4 00  
One man.....3 00  
Wood—2 1/2 cords at \$3 per cord.....5 25  
Salt—1,600 lbs at 2 1/2 cents.....40 00

Cost of 20 tons.....\$52 25  
Cost of one ton.....2 61 1/2  
In a furnace of three or four times this capacity the cost is decreased by 20 per cent.

The furnace is now working successfully at the Poe Consolidated Co.'s mines, in Fresno District, Nev., and at the Eschequer mill, Alpine Co., Cal. For further information, apply to

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WARRANTED SUPERIOR TO ANY OTHER  
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Sole Manufacturers of

### BRUCKNER'S PATENT REVOLVING FURNACE,

For Chloridizing, Desulphurizing and Roasting Ores.

—ALSO—  
STEAM ENGINES, SAWMILLS, SHAFTING, GEARING AND MINING MACHINERY.  
Send for our Illustrated catalogue.

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Importers of and Dealers in

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We would call the special attention of Assayers, Chemists, Mining Companies, Milling Companies, Prospectors, etc., to our stock of Clay Crucibles, Muffles, Dry Cups, etc., manufactured by the Patent Plumbago Crucible Co., of London, England, for which we have been made Sole Agents for the Pacific Coast. Circulars with prices will be sent upon application.  
Also, to our large and well adapted stock of

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Having been engaged in furnishing these supplies since the first discovery of mines on the Pacific Coast.  
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Assay Office and Chemical Laboratory,  
524 Sacramento St., S. F.

Deposits of bullion received, melted into bars, and re turns made in from 24 to 48 hours.

Bullion can be forwarded to this Office from any part of the interior by Express, and returns made in the same manner.

Careful Analysis made of Ores, Metals, Soils, Waters, Industrial Products, Etc. Mines examined and reported upon. Consultations on Chemical and Metallurgical questions.

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Ores worked by any process.  
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WORKING TESTS MADE.  
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### INSTRUCTIONS IN ASSAYING,

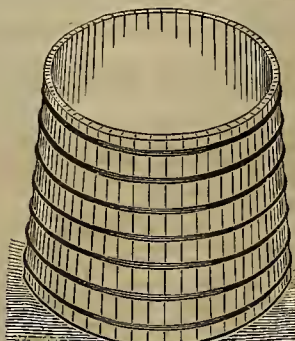
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Will receive a few pupils at his new laboratory, No. 617 Montgomery Street, up-stairs. TERMS MODERATE.

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WATER TANKS of any capacity made entirely by machinery. Materials the best in use; construction not excelled. Pan Staves, Tubs and Oak Guides for mining purposes a specialty.

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50 FINE CARDS, Damask, Repp, Etc., with name on 13 cents. CLINTON BROS., Clintonville, Conn.

MINERS, write for your paper.



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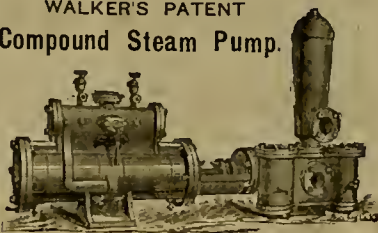
PARKE & LACY, 417 Market Street, S. F.

WALKER'S PATENT  
Compound Steam Pump.

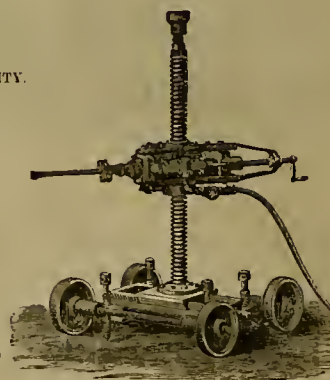
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ECONOMY IN FUEL.

POSITIVELY UNEQUALED FOR  
SIMPLICITY AND DURABILITY.

Air Compressors,  
ROCK DRILLS  
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Tunneling Machinery.



Machinists' Tools,  
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Plunger Steam Pumps—Cope & Maxwell's.

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Centrifugal Pumps—Heald & Sisco's.

Vertical Steam Engines, All Sizes—Haskin's.

Emery Wheels—Cosmopolitan.

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BATTERY FOR BLASTING—FARMER'S  
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Portable Hoisting Engines, for Use in Mining Districts, with Compressed Air or Steam.

VILLAGE HOOK AND LADDER TRUCKS,

Chemical Engines. Hose Carts and Portable Extinguishers. Babcock and Champion Fire Apparatus.

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MANUFACTURE AND ERECT

All Kinds of Mining Machinery, Mine Locomotives, Diamond Drills, Stamp Mills and Furnaces of All Kinds,  
**HOISTING AND PUMPING ENGINES,**

The latter a specialty up to ten foot bore cylinder, with Differential Valve Motion, superior to the Davy. Also their celebrated **Air Compressors and Rock Drill**, the victor of every Field—more work and Greater Durability Guaranteed than any other Machine built.

**TRIALS ASKED AGAINST ALL COMPETITORS!**

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MACHINERY OF ALL KINDS BUILT FROM DRAWINGS AND SPECIFICATIONS WITHOUT COST FOR PATTERNS.

### ASBESTOS COATING



For Steam Boilers, Pipes, etc. Best non-conductor of heat in use. It effects a LARGE SAVING OF FUEL, LASTS AS LONG AS THE IRON to which it is applied, and is reasonable in cost.

REFERENCES: United States Government Buildings and the principal manufacturing establishments in the East and on the Pacific Coast; the principal mines and mills in Nevada, etc., etc.

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(Patents issued September 4, 1863; October 5, 1863; October 4, 1870; May 9, 1871.)

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ASBESTOS STEAM PACKING, made from pure long fiber Asbestos. Indestructible and Self-Lubricating. Circulars and Descriptive Pamphlets Sent Free.

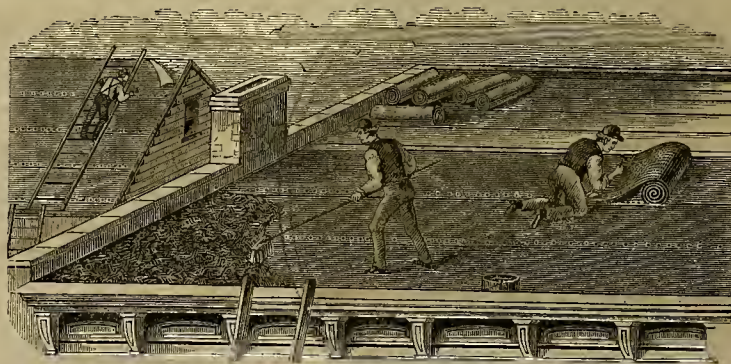
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**ASBESTOS ROOFING AND ASBESTOS PAINTS,**

**ASBESTOS CEMENT FOR LEAKY ROOFS**

Asbestos Roof Paints for Leaky Roofs,

**ASBESTOS BOILER AND PIPE COVERINGS**



FOR SALE BY ALL COUNTRY MERCHANTS.

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EXCLUSIVE IMPORTERS FOR THE PACIFIC COAST.

**San Francisco Cordage Company.**  
Established 1856.

We have just added a large amount of new machinery of the latest and most improved kind, and are again prepared to fill orders for Rope of any special lengths and sizes. Constantly on hand a large stock of Manila Rope, all sizes: Tarred Manila Rope; Hay Rope; Whale Line, etc., etc.

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611 and 613 Front Street, San Francisco.

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The undersigned, owners of LESCHOT'S PATENT for DIAMOND POINTED DRILLS, now brought to the highest state of perfection, are prepared to fill orders for the IMPROVED PROSPECTING AND TUNNELING DRILLS, with or without power, at short notice, and at reduced prices. Abundant testimony furnished of the great economy and successful working of numerous machines in operation in the quartz and gravel mines on this coast. Circulars forwarded, and full information given upon application.

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SUCCESSIONS TO EAGLE WORKS MFG. CO.  
MANUFACTURERS OF  
STEAM ENGINES, BOILERS, AND STAMP MILLS  
CRUSHING ROLLERS, AMALGAMATING MACHINERY  
FOR SYSTEMATIC MILLING, SMELTING, AND CONCENTRATION OF ORES  
AGENTS FOR  
BLAKE STONE BREAKER  
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Address, FRASER, CHALMERS & CO., Chicago, Ill.

Hoisting Engines, Diamond Pointed Rock Drills, Manufactured by M. C. BULLOCK.

GOLD, SILVER AND COPPER MINING.  
Reducing and Concentration Machinery.

**65** LARGE MIXED CARDS, with name 10c. and 3 ct. stamp. 25 styles Fun Cards, 10c. Samples 6c.  
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Ask Your Special Attention to Their IMPROVED GRADES OF POWDER, Viz:

## No. 1 GIANT,

Now the Quickest and Most Powerful Explosive Compound in the World.

## No. 2 EXTRA, a New Grade,

Which will hereafter be our second grade. It is of immense strength,

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NOTWITHSTANDING ITS GREATLY INCREASED STRENGTH,

Will be sold at the price of the old No. 2. Where a powder stronger than ordinary No. 2 is needed, we invite a trial of this new grade.

No. 2. Our Powder of this Grade will Continue of the Strength of our No. 2 of Last Year's Make.

It is a Strong, Reliable and sure Powder, and will do excellent work.

Special Attention is Called to the Reduced Price at Which We Will Hereafter Sell This Grade.

**JUDSON POWDER.** This New and Valuable Powder is Rapidly Coming into General Use as a Substitute for Common Black Powder, to which it is in all respects far superior.

Price 15 cents, or by car load 13 cents. In Cartridges, 2 cents extra. Discount as usual to the trade on our various grades of powder. Caps, single, double and triple force, also, fuse of all brands always on hand.

Send for Pamphlets and information to

**BANDMANN, NEILSEN & CO., General Agents Giant Powder Company.**

No. 210 Front Street, San Francisco, Cal.

# TWELFTH INDUSTRIAL EXHIBITION,

UNDER THE AUSPICES OF THE

**MECHANICS' INSTITUTE, SAN FRANCISCO, AUGUST 7th, 1877.**

The Board of Managers have the honor to announce that the TWELFTH EXHIBITION will be opened to the public on TUESDAY, AUGUST 7th, 1877, and continue open for at least 30 days thereafter. The Exhibition will be held in

## THE GRAND PAVILION,

Market, Eighth and Mission Streets, and easily accessible by six lines of City cars.

## THE EXHIBITION BUILDING---EXOTIC GARDEN---MECHANICAL ANNEX.

The BUILDING is 200 feet wide, 550 feet long, and 100 feet high, with a gallery around the inside 50 feet wide, beside a promenade 16 feet wide and 1,000 feet in length, from which an unobstructed view of the interior is obtained.

In addition to the above space there will be an EXOTIC GARDEN, 70 by 220 feet, for the display of the Fruits and Flowers of this Coast. Also, A MECHANICAL ANNEX, 200 by 50 feet, for the display of special Machinery.

A large and powerful engine will furnish the motive power for all machinery required to be in motion, while steam and water will be supplied in ample quantities to such machines or appliances as require them. The main line of shafting is 500 feet in length, with sufficient pulleys for all requirements.

## THE ART GALLERY

Is 400 feet in length and 50 feet wide, well lighted by skylights during the day and at night by the most improved reflectors. It will be made specially attractive, both in Pictures and Statuary. Many noted works of art are already promised, and it is confidently expected this department will excel anything ever before seen on this coast.

Over 6,000 gas lights will be used to illuminate the building during the evening. Four thousand seats will be provided for visitors. Also, a first-class restaurant, where refreshments of all kinds can be obtained at moderate prices.



## A GRAND INSTRUMENTAL CONCERT

Will be given each afternoon and evening by an orchestra composed of the best musical talent on this coast, and under the leadership of an experienced and popular conductor.

## PREMIUMS.

In accordance with the general request of exhibitors, the management have decided to offer liberal premiums at this Exhibition, consisting of medals and cash, all to be for the first degree of merit only. The medals will be of a new design, three and one-half inches in diameter, and similar to those awarded at the late Centennial exhibition.

A carefully prepared classified list of premiums will shortly be published.

Articles may be entered for competition or for exhibition only; if for the former they must be so designated when placed in position.

It is important that all parties intending to contribute to this Exhibition should give early notice of the amount and kind of space required.

A copy of the premium list, blank applications for space, rules and regulations, and any information regarding the Exhibition will promptly be given or sent by addressing the Secretary of the Twelfth Industrial Exhibition, San Francisco, Cal.

## BOARD OF MANAGERS:

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# MINING AND SCIENTIFIC PRESS.

An Illustrated Journal of Mining, Popular Science and General News.

BY DEWEY & CO.,  
Patent Solicitors.

SAN FRANCISCO, SATURDAY, AUGUST 4, 1877.

VOLUME XXXV.  
Number 4.

## The Coming Exhibition.

Before the next issue of the Press reaches its readers, the Twelfth Industrial Exhibition will have opened. All the arrangements have been completed and the exhibits are now being arranged in the Pavilion by the respective owners. All the available space having been spoken for, there is no doubt, of course, that there will be a full representation of our material progress. There seems to be a healthy spirit of competition manifest this year, which has resulted in quite full displays by different manufacturers and agents. The picture gallery will be particularly fine, we understand, so that lovers of art will not be disappointed.

The general arrangements will be somewhat the same as last year. The center will be occupied by exhibits of the agricultural and zoological productions of California and Oregon, wire-work, mirrors, articles of food, glass, and various miscellaneous contributions. In the right aisle will be machinery, pumps, the screw of the *Ajax*, artificial stone work, vitrified iron-stone pipes, asbestos roofing and metallic fire-proof roofs, bricks, oils and burning fluids, castings and products of foundries, quartz mills, and mining machinery, etc. At the end of the building, agricultural machinery. In the left aisle, principally carriages, buggies, wagons, and stoves of all kinds. The galleries will be allotted to furniture, sewing machines and miscellaneous articles.

The rookery and cave in the horticultural department have been completed. A stream of water will run through the cave and empty into the fountain, near the entrances. A large landscape, 70 feet in length by 35 feet in height has also been completed and will add greatly to the beauties of the garden. The sale of season tickets has already commenced, and the Managers are confident of a great financial success.

The opening exercises will take place on Tuesday, August 7th, at 2:30 P. M., at Baldwin's theater, Market street.

On the occasion of the opening of an exhibition of so much importance to the industrial interests of the coast, there should be a good attendance of those whose interests are represented. Artisans and mechanics of different trades should be allowed time to attend these exercises and those employers who can possibly spare their men, should do so on this occasion. A large has always appeared at the opening exercises of the different exhibitions and this one will not be behind the others in this respect; but as the fair is essentially an industrial exhibition, it is important that the industrial classes should be largely represented, and they should endeavor by all means to be present if possible.

The following programme has been arranged for the occasion:

1—Music.....	Band.
2—Introductory remarks.....	President Halliday.
3—Prayer.....	Rev. Mr. Jams.
4—Chorus.....	High School.
5—Recitation.....	John McCullough.
6—Music.....	Band.
7—Oration.....	Hon. Horace Davis.
8—Chorus.....	School.
9—Benediction.....	
10—Music.....	Band.

The exhibition will not be open to the public in the afternoon, but will open for the first time on the same evening at seven o'clock.

**COMSTOCK MINES.**—According to the returns made to the Assessor of Storey county, Nevada, the six productive mines on the Comstock lode produced the following quantities of ore during the quarter ending July 30th, 1877:

	Tons.	Average.	Bullion.
Belcher.....	6,837	\$23	\$ 134,753
California.....	49,967	92	4,627,450
Con. Virginia.....	39,773	95	3,775,362
Chollar-Potosi.....	9,104	15	145,489
Justice.....	40,776	13	743,063
Ophir.....	2,660	29	78,474
Totals.....	148,122	\$94	\$9,504,597

During the corresponding quarter last year the California mine produced 31,100 tons of ore, yielding \$4,519,700, an average of nearly \$146 to the ton, and the Con. Virginia mine produced 33,500 tons, yielding \$3,963,300, an average of \$118 per ton. For the same quarter the Ophir mine produced 18,250 tons, yielding \$669,200.

## Dry Amalgamation.

In those advancing times, when the mining community seem to be emerging from the old modes of handling our gold and silver ores, and especially as the reducing of them dry, no matter by what process they may be amalgamated, is generally conceded by our most experienced miners as being the surest for obtaining the largest per cent. of the precious metals, any machine performing this important work cannot otherwise than be particularly interesting to our mining readers. To this end we here illustrate Paul's patent pulverizing barrel, for the reduction of quartz to an impalpable powder, dry.

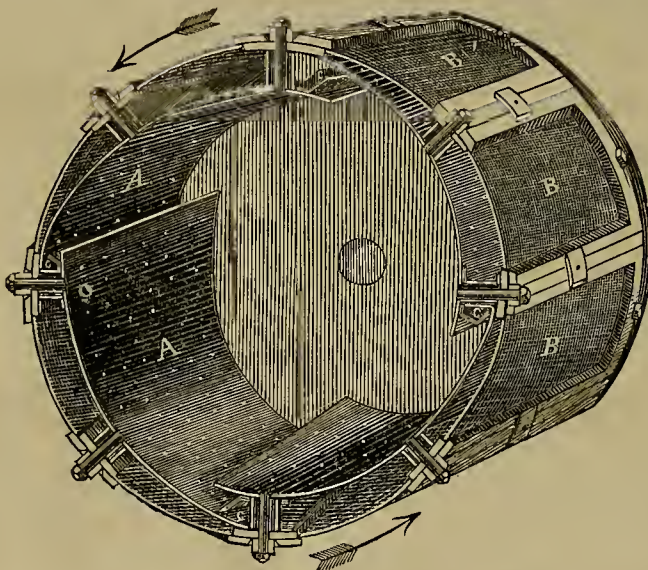
The cut here shown is an excellent view of one of the most durable and thoroughly practical pieces of mining machinery as yet introduced for this end. In operation it is pronounced by those who have used it as perfect in every detail. The inventor is Mr. Almarin B. Paul, whose mechanical skill has been displayed in very many articles of mining machinery, but of which this pulverizer, for ingenuity

No. 20 fine to flour, or even its approximate, then such machinery is not only expensive, but to do it dry, very disagreeable. This pulverizer of Paul's overcomes all these disadvantages.

The capacity of these barrels is only limited by the size. The largest yet made, however, has a capacity of 15 tons for 24 hours, reducing through wire cloth, having 4,900 holes to every square inch, or 12 tons reducing to 6,400 fine, or ten tons \$1,100 fine, this latter is absolute flour. A re-issue of this patent which embraces all the latest improved features, has just been obtained through this agency of Dewey & Co. It may be well here to say that these barrels are now being used in California, Nevada, Colorado, Arizona and Oregon, consequently they are no experiment. Such of our readers who may desire further particulars as regards this pulverizer, can obtain the same by addressing the inventor, Mr. Almarin B. Paul, room 20, Safe Deposit building, San Francisco, Cal.

## Items of Interest from the Mines.

We give below items of interest from prominent mines, most of which are collated from



PAUL'S PATENT PULVERIZING BARREL.

and usefulness, excels. The cut represents a half section of the barrel, and shows both the interior arrangement, with the perforated plates and guards, and also the exterior or sieves, through which all the pulverized ore passes, and mode of securing same to the periphery of the cylinder, all of which may be more minutely described as follows:

A represents the heavy iron plates which really form the barrel. When the ore is reduced to a given fineness, it sieves through these plates and on to the fine wire screens, B, which form the outside circle of the barrel. One of the ingenious features of the barrel is that all ore passing through the iron plates, and not fine enough to go through the wire screens, returns to the inside of the barrel at every revolution, at the point marked C. The turned plate at C forms a protection for fine screens, so no breakage can occur from the heavy quartz used for pulverizing the finer.

The cylinder is set on axles, and revolves to the left, as shown by the dart. It is all enclosed, thus preventing the escape of any dust. A very important point of this machine is, that it is self-feeding as well as self-discharging, and, that it enables ore to be pulverized to any standard of fineness, as per the wire cloth used upon the frames.

The purpose of this pulverizer is not to do away with stamps or other crushing machinery, but to come in as an intermediate one for doing the finer work cheaper and at the same time increase the capacity of the former by allowing them to work even coarser. Crushing ore only moderately fine can be readily accomplished by stamps, but when you undertake to reduce from, say

letters of the respective Superintendents on file at the offices in this city:

The ore in the south drift of the Leviathan has increased in quantity and improved in quality.

In the Gila the drift from chute No. 1, is now in 20 feet and has been in rich ore the entire distance, some of which assays from \$4 to \$600 per ton, and will probably average \$300. In the crosscut the indications for a body of ore look very encouraging.

The Justice south lateral drift, on the 1000-foot level, is looking very fine. The vein is, however, in a somewhat broken state; notwithstanding which some fine ore is produced and good progress is made in advancing the drift to the south.

The Grand Prize stopes continue to look fine; both mills are doing excellent work. The new mill is now running up to full capacity and crushing about 40 per tons per day. The ore is milling about \$100 per ton.

They have struck fine ore in paying quantities on the 150-foot level of the Coso Con., and are now breaking at this point the finest ore ever taken from the mine. The stopes above and below the 100-foot level continue to yield the usual quantity of good ore.

In the Eureka Con. the ore bodies on 5th and 6th levels are improving in extent the further the work is advanced. Have struck some ore in 10th level, with very fair prospects of striking an ore body. The furnaces are running along with the usual production, turning out about 24½ tons of bullion daily for the past week.

## The Rich Men of San Francisco.

If San Francisco cannot boast of having the richest man in the world, she can certainly claim to have the largest number of millionaires in proportion to her population, of any city in the world, and from the rapidity with which her rich men are adding to their capital, it is not unreasonable to suppose that not more than two or three decades will pass away before she will lead the list of the world in the individual fortunes of her wealthy men.

Probably the richest men in the world, at this time, are the Rothschild Brothers, whose incomes are estimated at about \$10,000,000 each, per annum; the Emperor of Russia, who receives an annual income of \$10,000,000, and the Duke of Westminster, whose income is now estimated at \$4,000,000, much less than it was a few years ago.

Compared with these names we have, in San Francisco, Flood, O'Brien, Mackey and Fair, sole owners of the Bank of Nevada, each of whose incomes exceed \$5,000,000 per annum; Stanford, Huntington, Crocker and Hopkins, who own nearly the entire stock of the Pacific railroad, with an annual income of fully \$2,500,000 each; Lux & Miller, \$2,000,000 each; D. O. Mills, President of the Bank of California, \$1,200,000, and Michael Reese, \$1,000,000; Donahue & Kelley are also supposed to be in receipt of \$1,000,000 each. The fortunes of all these men are increasing in a ratio, probably fully quadruple to that of any of the leading rich men of Europe.

San Francisco can boast of not less than forty persons whose fortunes exceed \$4,000,000, and probably nearly or quite as many more are worth from one to three millions of dollars. No city in the world can show anything like such an array of millionaires, in proportion to its population. When we take into account the fact that none of this is inherited property, and that it has all been acquired within about twenty-five years, and by legitimate business alone, the possibilities of San Francisco may well challenge the attention of the commercial world. None of the men of this city whose names have been mentioned have yet passed the prime of life.

These and similar facts are not unfamiliar to intelligent persons in Europe, and they are frequently alluded to in leading journals there, freely commented upon, and their significance freely if not fully considered and accepted. They are also considered in connection with the wonderful resources of this coast, and with the peculiar location of our city and her unrivaled harbor. The fact seems to be accepted that nature and the enterprise of the capitalists and leading men of this city, will soon place it at the head of the commercial cities of the world. It does not need an over sanguine temperament to predict that our next Centennial will find San Francisco the largest and the richest city in the world.

**BULLION SHIPMENTS.**—Since our last issue shipments of bullion from prominent mines have been as follows: Grand Prize, July 25th, \$12,200; Chollar, 25th, \$6,490; Con. Virginia, 26th, \$171,548.98—total on July account, \$676,228.81; California, 26th, \$161,046.52—total for July account, \$849,213.67; Northern Belle, 24th, \$10,562.75; Standard, 25th, \$19,154.52; Endowment, 27th, \$2,225.45—total to date, \$8,344.75; Northern Belle, 26th, \$11,067.31; Arizona, 28th, \$1,396.78; Grand Prize, 28th, \$12,200; 29th, \$13,000; Ophir, 26th, \$7,824.47; Modoc, 26th, \$3,224.15—total to date, \$39,364.90; Tyho Con., \$8,350.34—total to date, \$58,630.95; Modoc, 30th, \$3,211.92; Tyho Con., 28th, \$8,287.53—total to date, \$64,617.48; Northern Belle, 29th, \$14,002.40; California, 31st, \$169,083.55—total to date, \$1,018,247.22; Leopold, August 1st, \$3,500; Grand Prize, 1st, \$12,800; Chollar, 31st, \$16,273.40; Con. Virginia, 31st, \$278,452.65—total to date, \$954,681.46.

THE Empire (Grass Valley) in Nos. 6 and 8 south continues very small and the ground very hard, and no indications of improvement. Quartz is very scarce at present, the ledge being so small throughout the mine.



## In the Midst of a Cave.

## A Bit of Underground Experience.

Below the croppings of the Gould and Curry mines is to be seen a large cavity or sink which marks the spot under which a great cave occurred during the superintendency of Charley Bonner. Happening to pass over the ground yesterday we were strongly reminded of a rather perilous trip which we made into the underground regions of the mine at the time the cave occurred.

Luckily ample warning had been given by the settling of the ground within the mine and the snapping and splintering of timbers; therefore no lives were lost in the cave.

News of the grand crash in the mine spread rapidly through the town, and all who heard of the accident gave a sigh of relief when told that all the miners escaped uninjured.

The full extent of the cave, and the damage done thereby in the interior of the mine, was not known for some time, but from the cavity formed on the surface was judged to be very great.

Being desirous of obtaining, if possible, full particulars in regard to the condition of the underground sections of the mine, we called upon Mr. Bonner and made known our wishes.

"I have not been in the mine for three or four hours, and therefore am unable to give you an exact account of the present condition of the caved portions. However, if you will venture with me," said Mr. Bonner, "we will go in as far as possible and see how things look."

Having agreed to Mr. Bonner's proposition, two lanterns were procured and we soon found ourselves on the level where the greatest damage had been done. The miners had all left that part of the mine. Nowhere was to be seen the friendly twinkle of either lamp or candle; all was dark as the caves of the Cimmerii, save where the light of our lanterns fell upon the walls of the tunnel, along which we were advancing, or where the rays streamed far ahead and were reflected back by points of polished pyrites or bright quartz crystals.

At first, too, all was silent as the tomb, but, as we moved forward, the sharp snap of a failing timber or the dull boom of a heavy fall of earth reached our ears. These sounds constantly grew more distinct. Soon was heard a sort of running fire of sharp little snaps from the bent and splintering timbers, with ever and anon a startling musket-like report as some large timber broke in twain or was rent asunder.

We were now fast nearing the scene of the cave. And yet the ground about us was sound, and all the timbers stood intact in their places. Our advance was slowly and cautiously made. At times some unusual commotion caused us to halt and listen half a minute, with bodies inclined forward and eyes strained to penetrate beyond the light thrown out by our lanterns. Few words passed between us. "Wait a bit," or, "Now let us move on," from Mr. Bonner, was about all that was said.

Presently we came to a drift leading from the tunnel we had been traversing. The snapping and grinding sounds were now more distinctly heard.

"It is in this direction," said Bonner, leading the way into the drift.

We had not proceeded far before we came to where the timbers of the drift were badly bent and displaced. We were in a spot where the ground was settling. A kind of ticking noise came from the lagging overhead and along the sides of this drift, and dirt sifted down on our hats.

Soon we reached a place where the posts on the sides of the drift were bent like bows. The backs of these bows projected into the drift and were full of splinters, some of which were formed—snapped out—before our eyes. Shortly we came upon two posts bent out from opposite sides of the drift till their backs were not more than a foot apart.

"This looks bad," said Bonner.

"Very. Let us go back," said we.

"It cannot be far to the edge of the cave. We want to see that. Suppose we venture? Timbers are still strong when they snap."

"Then move on," said we, but our legs wanted to go the other way.

In passing between the two bent posts it was necessary to turn our bodies edgewise. All about us the timbers were working and groaning, but still stood some distance apart. At the end of the drift we came into a large open space—what seemed a long and broad chamber—and turning westward across this we were soon as near the edge of the cave as it was thought safe to venture.

Holding our lanterns above our heads, we saw before us a black and yawning pit or chasm. The light of the lanterns failed to show us either the top or bottom of this pit, nor could we see across to the further side. It seemed to have neither top nor bottom—seemed but a shapeless, boundless region of darkness.

Into this frightful pit there fell every half minute, from somewhere in the darkness high above, great masses of earth and rocks. At times, judging from the thunderous sound, hundreds of tons at once tumbled from the roof and sides of the chasm. Smaller masses were almost constantly dropping in some direction, while the spluttering, snapping and groaning of timbers in all directions was something frightful.

Suddenly, as we stood quaking in the midst of the tremendous commotion, a great mass of rock and earth fell from some place high up on the wall of our side of the shoreless sea of

darkness, almost grazing the brink of the chasm before us. With the fall of the mass came a rush of wind that nearly extinguished the candles in our lanterns. Elevating his light and gazing upward Mr. Bonner cried: "Fall back! fall back! the roof is giving way!"

Almost as he spoke a mass of several tons fell from the roof of our chamber not ten feet in front of us, and in falling took a large bite out of the edge of our floor.

"Quick, quick! This way! We must get out of this!" cried Bonner.

We ran back to the drift by which we had entered. The two posts between which we had squeezed had closed together.

"Back, back!" cried Bonner. "This way! I know a drift. Quick, we may reach it!"

Back along the drift we darted amid sounds never to be forgotten and such as have seldom stunned mortal ears. All about us was in motion—all rapidly sinking.

Bonner led the way across the chamber we had left a few moments before. In a corner, on the east side, the light of his lantern showed the mouth of a drift toward which he was hastening. Hardly was there time to observe this before he held up his lantern, crying, "Back, back!" and with a rumbling crash the mouth of the drift closed and the ground before and about it began to disappear.

"Quick!" cried Bonner, grasping our arm and hurrying us along. "To the drift again. It is our only chance!"

Into the drift we once more darted. Squeezing our way between the cracking posts we reached the place where we had before been stopped. Though crushed together in the middle, there was still a small open space between the posts at the bottom.

Throwing himself flat on the floor of the drift, Bonner pushed his lantern through the opening, then by a mighty effort struggled through after it. He seemed an hour in passing, though he probably wriggled through in less than ten seconds. Our fear that he would stick fast was agonizing.

"Quick! Give me your hands! Leave your lantern!" shouted Bonner, the moment he was through.

Instantly we were down and bad both hands thrust through the opening. In about two seconds we were hauled through as a hunter pulls a squirrel out of its skin. A short dash took us to the main tunnel, and as we gained it Bonner fervently exclaimed: "Safe at last, thank God!"

We were about to make similar utterance, when Bonner thrust his lantern into the mouth of the drift, crying: "Look, look! There she goes!" and as he spoke down went the shattered portion of the drift, breaking away to within fifteen feet of where we were standing. "Let us go," said we; "the whole mountain is falling!"

"All is sound here," said Bonner, "yet I don't care to remain longer. Had I known what we were getting into I should never have passed through this crumbling drift. However, 'all is well that ends well,' and you have seen and heard what you will probably neither see nor hear again should you remain in the mines all your life."

It was rather a lively bit of underground experience.

## The Big Air Compressor at Work.

The huge new air compressor, says the Gold Hill News, appropriately christened by the boys "Eolus," at the C. & C. shaft commenced operations on Saturday last, and is asserting its ability as the champion blower of the State. For lung capacity and endurance it is a powerful rival for the most rampant of our Washoe zephyrs.

The air cylinder is of 30 inches diameter and 36 inch stroke, lined with composition. This is encased in a water jacket, through which the circulating water carries off the heat engendered by the compression of air. The admission valves are supplied with safety rods and distance guards; the first preventing the valve from falling into the cylinder if the main stem breaks, and the second regulating the lift. The piston is packed with composition rings and fitted with a steel rod, and the crosshead, connecting rod crank, pillow block and shaft are of the most improved and substantial kind. The fly-wheel weighs 34,000 pounds and runs with the utmost smoothness and perfection. The steam-engine is fitted with all modern appliances and is a representative of the highest mechanical construction in that line to date. The cylinder is of 27 inches diameter and 36 inch stroke, fitted with steel rods and brass bushes. The balance valves and cross cut-off are adjustable while in motion, and all the work and material is of the best attainable. This mammoth machine, weighing 120,000 pounds and resting on a solid mass of masonry 20 feet deep, takes its place at the C. & C. shaft as the finest air compressor in operation on the Comstock.

There were three of the largest sized air compressors, two at the Consolidated Virginia and one at the C. & C. shaft, in full operation before the erection of this last, all connected with air pipes, but this last machine has a power more than equal to that of the three combined.

May it never lose its wind while there is a heated drift to cool or a panting miner on the levels below wanting more of the life-sustaining oxygen. This machine was manufactured by Prescott, Scott & Co., of San Francisco, who may well feel proud of their triumph, and who need no better recommendation for the manufacturing of such appliances than its exhibition when in full blast.

## Lowell Hill Gravel Mine.

M. Byrns, Jr., Superintendent of the Planet gravel mining company, situated on Lowell Hill district visited the mine on the 16th inst., and found everything in a satisfactory condition. The contractors Messrs. Schaefer & Wm. Keskeys are driving the tunnel in as fast as possible and expect to tap the channel by New Year's day if no harder rock is encountered than they have at present. The tunnel is a beauty, and shows what real miners can do; a tall man can walk upright with his plug on without touching the timbers, and a pair of Swimley's boarders can find room while the car is passing them; everything is done in the strongest and most approved manner and the tunnel is as straight as a line can be drawn. Mr. Byrns visited the adjoining mine, the celebrated Swamp Angel, and was kindly received by the Frick Brothers who own one-half of the mine. He found this main tunnel running in an easterly direction from Steep Hollow toward Bear river; at a point 600 feet from the mouth, the gravel is cut, and the present tunnel pierces it for a distance of 740 feet without any indication of getting through it and as no water flows from the tunnel, the opinion prevails that the main channel has not yet been reached. Cross tunnels have been driven in the gravel 700 feet north and 400 south and through all this immense deposit, which 50 years constant work through one tunnel will not exhaust, the gold seems to be uniformly distributed so that the owners can clear from \$12 to \$14 per day to each hand. Byrns asked George Frick what he thought of the Planet as a mining investment; he said, "your ground is as good as ours, and if I did not have all the mining business I can possibly attend to on my hands, I would invest the last half-dollar I own in your mine; that is I have faith enough in its real merit to warrant me in so doing."

Another strike in the same channel is Pat McCann's on the opposite side of Steep Hollow from the Swamp Angel; this is uncommonly rich and so extensive that the owner has already as much ground prospected as he can work through one tunnel in five years; both it and the Angel show gold identically the same as Bald Mountain yields and it is doubtless all from the same old river bed. For the information of stockholders in the Planet we wish to say that no officer connected with it gets any salary; they are working solely to make it a success, and look for their pay in the enhancement in value of the stock they hold. Every man who takes a share in this valuable property can rest assured that he will be fairly dealt with, for the management will countenance no rings or sharp practice and every owner will at all times be thoroughly posted on the situation of the mine by calling on any of the officers.—*Grass Valley Union.*

## The Cost of Smelting.

## Eureka and Utah Compared.

We give below a communication from a miner of Eureka district to the Salt Lake Tribune, contrasting the difference in the cost of smelting custom ores there and in Utah. It appears that the miners of Utah get better prices for their ores than is paid in Eureka:

In your issue of July 7th you gave an article on the small profits in reducing the ores of Bingham canyon, wherein the lead is made to pay the whole cost of mining, freighting, smelting, desilverizing, etc., leaving a profit of only \$1.20, thus leaving the silver it contains dead-head all the way through. Why not charge some of this cost to the silver contained in the bullion? Here at Eureka, which is also a lead producing camp of considerable importance, we make our profits on the silver, the lead being only a help to the cost you enumerated. Lead here is worth 60 cents per unit over 20% for a basis, giving us \$12.50 per ton for ore carrying 45% lead, over the silver, on which is paid 64% of assay value, while the cost of working is from \$20 to \$25 per ton, thus taking from \$7.50 to \$12.50 per ton from the silver to pay for working. So you see our lead goes only so far in paying the expenses, and our silver is not allowed to deadhead it through like Utah silver. I send you this to show you the difference between the way things are done in Utah and Eureka. Some of our smelters pay only 40 cents per unit over 20% basis for lead.

SAN PETE COAL.—A number of English gentlemen have gone to San Pete to examine the coal fields of that valley, and the practicability of a railroad from there to market. We understand that there is talk also of the Central Pacific Railroad Company purchasing some of these claims, with a view to putting down a road from Ogden to San Pete valley. Such an undertaking would relieve the Central Pacific of their allegiance to Apostles Gould and Dillon, and at the same time develop one of the richest resources of this Territory. The extension of the Central Pacific to San Pete would create a competition in the coal and coke trade, as well as reduce the price of freight on the exports of Utah. But as matters now stand, the Pacific road is dependant upon the U. P. for coal, the price of which is of more importance to it than the margin on outgoing freights from the Territory; hence Apostles Gould and Dillon have a monopoly of the freight tariff by reason of their coal monopoly, and they will continue to so have it until the Central Pacific frees itself from their clutches by opening up coal fields of its own.—*Salt Lake Tribune.*

## Meadow Lake.

The Dutch Flat Forum speaks of this old district as follows: The Pittsburg company's ledge is located on Excelsior flat, and shows a width of six feet along the surface. The quartz is of a dark color, and of the usual quality found in the district, with the exception of a narrow vein of white quartz, running parallel with the ledge. This white quartz was found to be rich in free gold, and does not carry any of the base metals, with which all the other ledges in this district are cursed, as they have not, as yet, been subjected to any process by which the gold can be successfully separated from the baser metals. A shaft is being sunk on this ledge, and although they have only reached a depth of 10 feet, the streak of white quartz that was only four inches wide at the surface has increased to two feet, and none of it assays less than \$30 per ton, but the greater part of it shows a richness of from \$250 to \$450 per ton. This has caused considerable excitement among the Meadow Lagers; some who had become disgusted and left have returned and are making new locations. Others, who never lost confidence in the richness of their mines, stuck to what they had, and gobbled up other ledges as they were abandoned, are now feeling jubilant.

A gentleman by the name of Mr. Crail, one of the first locaters in this district, but who left shortly after, when it was discovered that none of the ledges could be made to pay unless some new process could be discovered for their successful working, after an absence of several years, returned recently from Wyoming Territory, and is now located at Meadow Lake. He has with him a patent on smelting works, "himself" the inventor, and claims that through this process the ledges of Meadow lake can be made to pay good dividends. Frank Pauson, of Truckee, one of the heavy owners in this district, has furnished Mr. Crail with the necessary means to construct and put his smelting works in working order.

## Gold Hill Mine—A Good Start.

A day or two ago we took a walk over to Gold hill. Here is the first quartz location in Nevada county—early in the summer of 1850. The Gold Hill grounds which have lately passed into the hands of a new company, are partly within, partly outside the corporate limits of Grass Valley, hence the new movement is one of more than usual interest to our citizens. During the 14 years of the history of this mine, from its location in 1855, it is believed to have turned out not less than \$4,000,000 in gold bullion, and owing to the peculiar character of the ore good judges declare that half as much more gold was taken out in the shape of "specimens," making the yield of the mine \$6,000,000. This, too, from mere shallow workings—the greatest depth attained being no more than 300 feet on this incline.

For the first 140 feet this shaft dips at an angle of 45°, until it strikes the vein, which it follows 160 feet more at an average dip of 28°.

The new shaft, which was just begun and the first combination of timbers just set as we were there the other day, starts in some distance back of the old one, and will go down at a dip of 32°, so as to give the whole 300 feet that dip, and allow of the free working of the big pump at that level. The present company, under the superintendence of Mr. George Lord, a miner of large experience and who was one of the last to work in this mine in its balmy days, intend putting on machinery of capacity to work and drain the mine to a depth of 1,000 feet. A splendid 16-inch engine, with boilers to match, is already on the ground and the work will be pushed to completion at an early day.

This resumption of work in that region will undoubtedly start up many more old favorites known to be yet good. There is said to be a continuous communication in quartz between the workings on Massachusetts hill and Gold hill and should the consolidated interests on the former take hold and put down a big, permanent shaft on Seadden's flat, these mines would very soon add an equivalent of 2,000 or more to our population.—*Foothill Tidings.*

"A WARNING TO INVESTORS."—Mr. Thomas Moy writes to a London, E. C., morning paper under date of June 26th, as follows: My advice (the result of long experience) to investors, when they are going to communicate their inventions to the government, is—don't. The case of Thomas vs. the Queen is one more instance proving the above to be sound advice. It is a monstrous injustice to inventors that their inventions may be used without remuneration. The individual may not be a pirate, but the whole nation may be legally a nation of pirates. Fifteen years ago I invented and proved by experiment, on a small scale, a valuable improvement, which would have been exceedingly useful to the Royal navy, and therefore to the nation at large. I wrote to the Admiralty, offering to communicate my invention to them, provided they would undertake to remunerate me if they adopted it. They replied by sending their usual circular, and refusing to guarantee remuneration. That was enough for me, and so I have kept my secret for 15 years, and shall continue to do so until I can see my way to be well paid for it. It would be of great use now to our navy, but I am not loyal enough to go through such experiences as Suider, Palliser and Lynam Thomas have had from the idiotic conduct of government officials.



## MECHANICAL PROGRESS.

## A New Form of Boiler.

Boiler-makers know that it is not easy to draft a form of steam boiler which will not show objectionable points, and when the need comes to increase capacity, all danger and difficulties increase in a geometrical ratio. We read in *Iron* that an English firm hope to overcome the objections which can be brought against the old Lancashire and Cornish styles of boilers by introducing another design:

It is formed principally by two parallel shells of comparatively small diameter, which are connected by a large number of short vertical tubes. These two principal shells are placed one above the other, and again above the upper shell is connected a small steam-chest with two small pipe connections, one at each end. The employment of this form of elephant boiler with two or more shells and externally fired, enables large grate surface to be provided with small diameter of shell, thus proving extremely valuable for burning wood shavings, or any other light combustible, and, at the same time, enabling the boiler to carry a comparatively high working pressure with safety, say from 80 to 100 pounds per square inch.

The arrangement of the double shell also provides that very little danger is likely to be incurred from shortness of water, as in Cornish or Lancashire boilers. For in these latter boilers a fall a few inches below the average water level will lay bare the crown of the flues, which are the plates most exposed to the fiercest heat of the fire, and therefore the most likely to be burnt and to collapse. In the elephant boiler the average water level is at a height of two-thirds of the upper shell. The fire, also, is placed underneath the lowest shell; then returns along the sides of that shell and then back again under the upper shell. The whole boiler must then be entirely empty before the plates nearest the fire are laid bare, and should the upper shell become entirely emptied the plates would not be exposed to sufficient heat to cause any serious apprehension of danger. This is a great point of safety, as many explosions are undoubtedly caused by over-heated plates from shortness of water.

A special and unique feature in this new boiler is an ingenious arrangement of dip tubes to promote circulation. In every alternate short connecting pipe between the two shells a loose dip tube is dropped within a few inches of the bottom plates of the lower shell. These tubes will determine the circulation downwards through them from the upper shell, and the upwards circulation of steam and hot water will ascend through the alternate short junction pipes without dip tubes. The circulation thus produced is most decided. A stream of the coldest water is brought down directly to the hottest plates over the fire, which are thus much protected from wear and tear, and one of the great evils in long cylindrical shell boilers, viz.: "hogging," is, we should believe, entirely prevented. The main shells of the boilers are brought out beyond the brick setting by projecting manholes, which will prove very handy in cleaning out and inspecting.

## A Monster Sugar-Pan.

We use sugar machinery in this State and our mechanics make some of it. Both users and makers will be interested to read of the largest vacuum pan ever made. *Iron* says it was made by James Duff & Sons, Greenock, and gives a long description. We take out a few points on dimensions: This "giant" of the vacuum-pan tribe is about 13 feet in diameter at its widest part and a little over 14 feet in depth from the top flanging, or 11 feet from the boiling line. It is somewhat of the heart shape, presenting as it does, the form of an inverted irregular cone, contracted to a point at the apex and widening gradually and quickly towards the base, the lower part being somewhat flattened. The body of the pan is built in three tiers, consisting of the bottom, the "crib" or center-piece and bell-mouth respectively. The bottom is in one piece, while the "crib" is composed of three large segmental copper plates, joined together in a curved circle by means of flanges at their side edges, and to the bell-mouth and bottom respectively, by means of flanges at their upper and lower edges. The bell-mouth or top-piece is then surmounted by a large tapering copper pipe or neck (called the "swan-neck"), by means of which the pan is connected to a large cast-iron condenser on a super-jacent floor of the refinery building, the condenser being in turn connected at the back end (for it is set horizontally) by means of a large pipe, (called the "vacuum pipe") to two powerful exhausting air-pumps, placed in communication with the pan, the water of condensation being carried off from the condenser through the medium of a so-called "balance" or "atmospheric" pipe. Intermediate between the vacuum-pan and the condenser, a large copper receptacle (called the "tell-tale" or "safe") depends from the under side of the neck-pipe, for the purpose of catching and retaining, till the close of the boiling operation, any liquor

that may be carried over from the pan towards the condenser through violent ebullition, and which, if not so caught, would pass on to and through the condenser and so be carried off with the water of condensation and lost. The contents of this vessel are indicated by means of a glass gauge at the side and are drawn off in due course through the medium of a stop-cock at the bottom.

The lower half of this monster sugar-kettle contains the heating media, which consist of no less than 11 large serpentine steam-worms, spirally arranged and adapted to the curvature of the pan. These steam-worms are four and a half to five inches bore and about 900 feet in combined length, giving a heating surface of 1,119 superficial feet or thereby.

The gross contents of the pan, up to the boiling line, is 973 cubic feet, or about 6,080 imperial gallons. The worm displacement amounts to 111 cubic feet, thus leaving the net capacity of the pan 862 cubic feet or thereby, while the heating surface stands to the net capacity as 1.3 to 1. It is calculated to boil 40 tons of sugar when charged to the boiling line, the time occupied in the process being from four to seven hours, as the quality of the liquor and other circumstances may vary; the product in marketable sugar from this quantity being from 47 to 50 tierces. The shape of the pan is highly favorable to quick boiling and rapid evaporation and concentration of the syrups; while the heating, condensing and vacuum power are, in every sense, replete and in fine symmetry with the gigantic dimensions and enormous capacity of the vessel; and as for workmanship, it is a fine specimen of the copper-smith's art.

PROGRESS OF WIRE CABLES.—The advance which wire cables are making and the way in which they are being rapidly substituted for ropes, chains and belts, has been frequently noted in these columns. We have now a report of some important trials of steel wire-rope hawsers which have been lately made at Portsmouth Dockyard, the results being such as to astonish the operators as to the enormous tensile strength which had been imparted to the wire. Steel is not only entering largely into the construction of our ships of war, but their standing rigging and hawsers are being gradually made of the same light and durable material, and in a short time the London *Times* expects that the present unwieldy chain cables in use will be superseded by steel wire cables of moderate thickness and weight. The recent tests at Portsmouth were of various samples of steel wire hawsers for towing purposes, it having been found from the experience of the *Valorous* and other ships that a wire hawser possesses equal flexibility to the best hempen rope, combined with less weight, superior handiness, and greater endurance, without any increase in the first cost. Official experiments at Portsmouth have also established the fact that the breaking strain of a steel hawser is more than three times that of a rope hawser. Thus a 9 in. ordinary hawser will break under a strain of 16½ tons, and a 19 in. hawser under a strain of 72 tons, whereas Bullevant & Co's 3 in. steel hawser broke at 18 tons, and their 6 in. hawser at 80 tons. In the matter of weight the advantage is also clearly on the side of the steel, the 3 in. and 6 in. wire hawsers weighing 7 lbs. and 29 lbs. per fathom, while the 9 in. and 19 in. hempen hawsers weighed 19 lbs. and 84 lbs. per fathom. The samples operated upon were respectively of the circumference of 3, 4, 5 and 6 in. The core of each was formed of tarred hemp, over which was twisted 6 strands, each strand being composed of 19 highly-tempered steel galvanized wires. The 3 in. hawser, which was formed of 15 gauge wire, broke at 22½ tons; the 4 in. 14 gauge, at 35½ tons; the 5 in. 12 gauge, at 57½ tons; and the 6 in. 10 gauge, at the enormous strain of 100½ tons. In every instance the strands parted at the splicing, which were the only parts displaying any appreciable elongation under the tests.

PROGRESS OF THE METRIC SYSTEM.—The Boston Society of Civil Engineers has the distinction of being the first organized professional body in the United States to make a systematic effort to secure the introduction of the metrical system of weights and measures into general use in this country. The society appointed a committee, whose duty it was to open communication with the various learned societies and leading manufacturers throughout the country, and secure the favorable action of Congress upon a memorial fixing a date for the official adoption of the metrical system, by the potency of a combined appeal from these influential sources. The report of this committee now before us, says the *Polytechnic Review*, after showing that the metrical system is steadily growing in favor in this country, states that 29 replies were received from societies which were addressed as above noted. Of these replies, 16 were favorable, 5 unfavorable and 8 undecided. On the unfavorable list, the American Academy of Arts and Sciences indefinitely postponed the matter by a vote of 10 to 8, on the ground that "it would be a hardship to deprive the people of their present standards if they preferred to use them;" and the Franklin Institute rendered its decision in favor of the sweeping statement "that the objections to the attempt to adopt the meter as a standard unit of linear measure are overwhelming." These two bodies are the most prominent objectors.

## SCIENTIFIC PROGRESS.

## Geometrical Chemistry.

We gave at the time of its first appearance a synopsis of a theory of a geometrical chemistry as proposed by Prof. Henry Wurtz. We notice now by the *Iron Age*, that the faculty of the Stevens Institute of Technology have paid a graceful tribute to American progress in science, by conferring the honorary degree of Doctor of Philosophy upon Prof. Henry Wurtz, A. M., for original research, and especially for the discoveries upon which he bases his remarkable theory of geometrical chemistry. As this is the first time the faculty have used the power to confer honorary degrees, and as the faculty, which includes such eminent scientists as Morton, Thurston, Mayer, Leeds and Wood were unanimous in the opinion that Prof. Wurtz's discoveries were of sufficient value to merit the highest honor in their gift, the compliment is one of which any man of science might be proud. Prof. Wurtz has discovered a great number of facts in relation to the mathematical relations of molecular volumes—facts which had previously been entirely unsuspected as well as unknown. The first point sought by Prof. Wurtz was a standard temperature of nature. This he very conclusively demonstrates to be the temperature of ice at the point of incipient fusion. This found, the first fact discovered was that the volume of all single chemical molecules with one exception, are expressed by quantities which have the relations of even cubes of whole numbers. The one exception is oxygen, the molecular volume of which, deduced from a comparison of water with peroxide of hydrogen, is 5,184, or three times the cube of 12. Calculations made upon the immense number of density terminations, fails to show that oxygen ever changes this volume—or diameter, as it is perhaps more appropriately called. Another discovery is the fact that hydrogen is the most variable of all the elements. It is found that molecules which combine to form a new substance, tends to assume very nearly the same size. Again, the tendency to vary increases with the electro-positive nature of the element. Later researches develop the fact that, in many different series of compounds, the diameter of some one element or elements vary in different members of the series by four units. The significance and importance of these facts alone are enough to render Prof. Wurtz's labors worthy of high honors.

MATING AMONG FISHES.—A writer in a Berlin contemporary contributes some details of his experiences in pike fishing, which tend to show that the idea commonly entertained that the removal of the male fish from a water about spawning time has less effect upon the stock than the capture of the females, is altogether erroneous. Four or five weeks before spawning commences the jack seek the neighborhood of the shore in groups, and he has invariably observed that each of these consists of one female accompanied by one or more male fish, and so continues, unless disturbed, till the breeding season is over. As a rule a female of small size is accompanied by one male only; a medium sized mother-fish has two or three males, and a full sized one as many as four or five. The larger the mother-fish the smaller, as a rule, are her attendant squires, the weight of the former being generally about equal to that of all the males put together. If the males of a group be caught shortly before spawning time, the bereaved female does not mate again that season; in due time of course she deposits her roe, but it remains unfertilized, and so perishes. By removal of some of the dorsal scales from all the members of the group taken in a net, so as to render their identification easy, it was found that on replacing them in the water at considerable distances from each other, they invariably reunited in a very short space of time. Under no circumstances was the spawn of a female bereaved of her attendant males, impregnated by the milt of others in the same water, however numerous the latter might be.

A NEW SERIES OF OBJECTIVES.—At the latest meeting of the S. F. Microscopical Society, a letter was presented from Charles A. Spencer, of Geneva, New York, which was received in answer to an enquiry about "Spencer's Objectives." Among other things Mr. Spencer writes: "From notices in the *London Microscopical Journal*, the *American Naturalist*, the *American Journal of Microscopy*, the *Cincinnati Medical News*, etc., it is quite evident that your Microscopical Society is a live one, and a gratifying fact it is to all devotees of science. I would give a cordial expression to the hope that its future progress may fulfill its present promise of being an honor to us all." In answer to an enquiry, Mr. Spencer gave a description of a new series of objectives he was working up, in which he has it as a special aim to produce "a series of objectives of quite moderate prices, yet of a high grade of excellence and of such almost absolute uniformity of quality that the purchaser need have no fear of disappointment in this respect." It is probable that the Society will have the opportunity of testing Mr. Spencer's new work. He is among the foremost of the optical instrument makers of this country; having made the telescope with which Professor C. H. F. Peters, of Hamilton College observatory, has discovered more asteroids than any other single observer, and a microscope for the late Professor Agassiz.

## Pitury—A New Stimulant.

We learn from *Nature*, that Baron Von Mueller in a recent letter to the *Australian Medical Journal* describes the origin of the Pitury, a stimulant said to be of marvellous power, and known to be in use by the aborigines of Central Australia. After years of efforts to get a specimen of the plant, he had obtained leaves, but neither flowers nor fruits. He can almost with certainty, after due microscopic examination, pronounce those of the Pitury as derived from his *Duboisia Hopwoodii*, described in 1861 (*Fragm. Phytogr. Austr.*, II., 138). This bush extends from the Darling river and Barcoo to West Australia, through desert scrubs, but is of exceedingly sparse occurrence anywhere. In fixing the origin of the Pitury, a wide field for further inquiry is opened up, inasmuch as a second species of *Duboisia* (*D. myoporoides* R. Br.) extends in forest land from near Sydney to near Cape York, and is traced also to New Caledonia, and lately by him also to New Guinea. In all probability this *D. myoporoides* shares the properties of *D. Hopwoodii*, as he finds that both have the same burning acrid taste. Baron Mueller adds: "Though the first known species is so near to us, we never suspected any such extraordinary properties in it as are now established for the later discovered species. Moreover, the numerous species of the allied genus *Anthocercis*, extending over the greater part of the Australian continent and to Tasmania, should now also be tasted, and further the many likewise cognate *Schwenkeas* of South America should be drawn into the same cyclis of research, nothing whatever of the properties of any of these plants being known. The natives of Central Australia chew the leaves of *Duboisia Hopwoodii*, just as the Peruvians and Chilians masticate the leaves of the coca (*Erythroxylon coca*), to invigorate themselves during their long foot journeys through the deserts. I am not certain whether the aborigines of all districts in which the Pitury grows are really aware of its stimulating power. Those living near the Barcoo travel many days' journey to obtain this, to them, precious foliage, which is carried always about by them broken into small fragments and tied up in little bags. It is not improbable that a new and perhaps important medicinal plant is thus gained. The blacks use the *Duboisia* to excite their courage in warfare—a large dose infuriates them."

NO BONES IN THE OCEAN.—Mr. Jeffrey has established the fact that bones disappear in the ocean. By dredging, it is common to bring up teeth, but rarely ever a bone of any kind; these, however compact, dissolve if exposed to the action of the water but a little time. On the contrary, teeth—which are not bones any more than whales are fish—resist the destroying action of sea-water indefinitely. It is, therefore, a powerful solvent. Still, the popular opinion is that it is a bribe. If such were the case, the bottom of all seas would, long ago, have been shrouded by immense accumulation of carcasses and products of the vegetable kingdom, constantly floating into them. Dentine, the peculiar material of which teeth are formed, and the enamel covering them, offer extraordinary resistance to these chemical agencies, which resolve other animal remains into nothingness. Mounds in the West, tumuli in Europe and Asia, which are believed to antedate sacred history for thousands of years, yield up perfectly sound teeth, on which time appears to have made no impression whatever.

MEXICO.—We are pleased to receive a sample of what our sister republic of Mexico is doing in the way of increasing knowledge of her development and resources of different kinds. Last February there was issued the first number of an official periodical entitled "*Anales del Ministerio de Fomento*." This branch of the government has cognizance of all internal improvements, both of public and private expense, and all scientific exploration to ascertain the topography, geography and various resources of the different Mexican States. The publication of information of this valuable nature under the approval of the government, carries assurance of its accuracy and trustworthiness, and will be hailed with pleasure by many who are waiting for more knowledge of the Mexican republic; believing that the country is indeed a cornucopia in nature as well as form. The first numbers of the "*Anales*" show that the work of making the country known to her own citizens and foreigners is to be done scientifically and creditably. Our acknowledgements are due to the Hon. Riva Palacio for copies of the "*Anales*."

GIANT POWDER IN ARCTIC EXPLORATIONS.—The accounts of the English Arctic expedition under Capt. Nares, show the application of many devices supplied by the advancement of science in overcoming the many obstacles presented by nature to guard the approach to the pole. Electricity made day of the five months of night, while dynamite opened the way through heretofore unsurpassable ice barriers. Cartridges of dynamite were simply placed upon the surface of the ice and their explosion was sufficient to clear a passage. Where large masses of ice were encountered, mines were dug, the cartridges placed therein, and the passage choked up with ice blocks so as to increase the effect of the explosion. By simultaneously exploding a number of these mines, open tracts for the passage of the vessels were easily obtained.



The woolen goods commission firm of Thomas & Co., of New York, have failed for \$500,000.



## MINING SUMMARY.

The following is mostly condensed from journals published in the interior, in proximity to the mines mentioned.

## California.

## ALAMEDA.

**NEW COAL MINE.**—Alameda Independent, July 23: In the hills east of Mission San Jose there seems to be evidence of the existence of coal mines. Along the upper portion of Alameda creek, four or five miles beyond Sunol, Patrick Guay has been boring a tunnel for some months past into the solid rock in search of coal. He has run a distance of 70 feet already, and found a vein of coal four inches thick. It is of excellent quality and burns well—better even than the Livermore coal. Old coal miners think that by going 70 feet deeper a well-developed good-sized vein will be found.

## AMADOR.

**A BIG FIND.**—Amador Ledger, July 23: Last week the gravel claim of Wheeler & Bradshaw surrendered the largest chunk of gold ever found in the neighborhood of Folsom. It weighs a trifle over 33 ounces, and is estimated to be worth about \$500. A Mexican also picked up a nice little chunk of the coveted metal on another claim, in the same locality, a few days ago. These cheering discoveries would tend to stimulate mining industry at the grove were it not that the water has given out. As it is, things are at a standstill, and must remain so until the fall.

**DOYLE CLAIM.**—Work was started on the Doyle quartz claim, at Hunt's gulch, this week. Three or four men are employed sinking the shaft. A good sized vein of decomposed quartz is met with, which prospects well. It is intended to sink to the depth of 80 feet and then drill into the hill.

**BUNKER HILL.**—A correspondent sends us the following: Bunker Hill is showing more than the usual quantity of good ore in the under stopes of the 170-ft level and also in the 350-ft level. It yields a steady revenue each month.

**GOVERN.**—In the Govern mine, the immense body of ore above the 700-ft level began settling last Saturday, and it required all the skill of foreman Philip Oates to prevent serious consequences. A section of the ore body, of about 300 or 400 tons in weight, broke away and threatened to go through the 700-ft level, but timely and energetic action prevented harm.

**PLYMOUTH.**—Vaughn & Co. will commence sinking the shaft on their quartz claim this week. This claim is located on the west side of Indian creek, near the Cosumnes river. The rock has paid as high as \$20 per ton. The outlook is for brisk times in the development of quartz claims in this section. Samuel Cupps & Son have a quartz claim, which they are now working, located north of Dry creek, about one and a half miles east of Plymouth, for which they have been offered \$2,000. Very little work has yet been done, and the offer of \$2,000 is simply for the prospect of a paying mine.

## ALPINE.

**CONCENTRATORS.**—Alpine Chronicle, July 23: On Wednesday last two concentrators, for the Advance mill, arrived, and will be placed in position next week.

**ILLINOIS-CALIFORNIA.**—Good work is being done on the mine, and the tunnel measures 1,200 feet.

**SUNNYSIDE.**—The tunnel of this mine is in 235 feet.

**S. L. SINKING.**—At the rate of 11 feet per week and drifting 40 feet.

**SILVER CREEK.**—Tunnel of the Silver Creek in 105 feet.

## BUTTE.

**THE MINES ON BUTTE CREEK.**—Butte Record, July 23: The incontrovertible fact remains patent to every eye that the hill diggings of the Butte mill will not yield the vast stores of mineral that are known to exist here, unless there is a ditch of water brought from the canyon upon the hills, so as to use the hydraulic process. There are more men on the creek this year than we have known for a long time. Messrs. Striker & Morice are bringing a ditch from Texas bar, which will cover all the intermediate bars and benches between Cooke's and Centerville in the east side, which will afford employment for a great many men. Malby & Reister, on Paradise Flat, have plenty of ground that will pay good wages for years. Some of the river claims are paying well, but the hills remain unworked for want of water.

## CALAVERAS.

**TUNNEL TO BE ANCHORED.**—Calaveras Chronicle, July 23: The water company have determined to arch the tunnel that perforates Cape Horn ridge, through which the flume is laid, to prevent its caving during the rainy season. The rock through which the tunnel is dug slakes and caves in wet weather, and has been the occasion of a good deal of trouble and expense. A road has been built to the tunnel, and the shaft with which it is to be arch is now being hauled. When encased with substantial masonry, all further trouble will be obviated.

**OWIN MINE.**—The shaft in the Owin mine has reached a depth of 75 feet, work progressing rapidly and favorably. Scarcity of water prevents the running of more than 16 stamps, and it has become necessary to employ steam in pumping.

**ROCK CUT.**—Gass & Co., at Mosquito gulch, have out about 60 tons of good rock, which will be shortly hauled to Orland's mill and crushed.

**MACHINERY ARRIVED.**—A portion of the machinery belonging to Garland's new mill, in Chile gulch, has arrived upon the ground, and the remainder of it is daily expected. The mill will be in readiness for operation by the time water is obtained.

**MOSQUITO GULCH.**—Times are quite lively in Mosquito gulch. The mining interest is flourishing and business of all kinds is looking up. We hear it stated that arrangements have been perfected by which the well-known San Bruno, Good Hope and Vance mines are to be brought under one proprietorship and systematically worked. It is capital to put them in proper shape for working to advantage and furnishing the machinery necessary. The mines mentioned can be made largely and permanently remunerative.

## INYO.

**REX MOUNTS.**—Coso Mining News, July 23: Last Wednesday there passed through here, per Wells, Fargo & Co.'s express, four bars of silver bullion from the Rex Mount mine, situated at Independence, in this county. The aggregate value was stated at \$1,000.

**DEFIANCE.**—In the last few days about 250 tons of ore have been delivered at the furnace dumps of the Defiance, and it now looks as if the furnace would start up sooner than we predicted in our last issue. Work on the mine is being driven rapidly ahead, the indications in the drift to strike the back ledge improving with every foot gained.

**EMIGRANT BULLION.**—Last Saturday afternoon, Peter Taylor, Superintendent of the Emigrant company's mines, at Lee district, brought in and had shipped by express two bars of silver bullion, aggregating 1,500 ounces. One bar of bullion was 850 fine, the other 950 fine. This was the result of 72 hours run of five stamps and only a partial clean-up being made, there being some \$300 worth of amalgam still in the pans. Taylor says the result is very satisfactory indeed, and Mr. Smith, the mill man, says he never worked freer ore. The mill is now running splendidly, there being plenty of water. There is plenty of ore on the dumps and more daily being developed in the mines.

## NEVADA.

**NEVADA CLEAN UP.**—Nevada Transcript, July 26: The Manzanita company made a splendid clean up a few days ago. They took out two hundred and eighty pounds of amalgam, which was valued at over \$35,000, or \$125 per pound. In the sluice several pieces of rock were seen that contained about one-half an inch of gold on the surface, and it was expected the run would be one of the

best made this season, and they were not disappointed. This mine is situated at Sweetland, and is owned by the Milton mining and water company, and is one of the very best in the county. This clean up was from a twenty-five-days run, but in reality only about twenty full days were consumed. In this mine they employ only about 25 men, and of course the labor expense is not very large. They have ground enough to last for 15 or 20 years to come, and an unusual small amount of ground was worked at this clean-up to produce the above result. The mine has been fitted up in the most perfect manner, and is worked perhaps to better advantage than any mine in Bridgeport township. Arrangements are now being made to put in a drilling machine, to be run by an air compressor similar to the one in use at French Corral. Richard Thomas, one of the best mining Superintendents in that township, has charge of the mine, and is managing the affairs of the company in a very skillful manner. V. G. Bell, Esq., is the General Superintendent, and a large owner in the Milton mining and water company.

## PLACER.

**WATER.**—Dutch Flat Forum, July 23: The water supply is getting quite limited. The South Yuba Canal Company is now drawing from its lake. The ditch of the M. & A. Utah Company is dry; and that of the Cedar Creek Company has nearly only two hundred inches running in it. This company, however, has not yet commenced drawing from its mountain reservoirs, as the water stored therein is held in reserve, for opening up the B. & C. claim.

**THE ROSA STAR CLAIM.** has continued washing as constantly as circumstances will permit. The blast exploded in the du on the 23d of June did wonderful execution, loosening up an immense quantity of gravel which aided greatly in enlarging the size of its pit. This claim has an opening so large that work can be done to much better advantage than heretofore, and its prospects are improving rapidly.

**THE SOUTHERN CROSS CLAIM** exploded a blast of 400 kegs of black powder on the 23d of June, which covered the bottom of the pit and filled the shaft with boulders and gravel. A force of men have since been engaged in raising another shaft to the surface, which is just completed and is now ready to commence washing again. The sluices in the tunnel below are being cleaned up, after which it is the intention to take a fresh start and make a good run.

**THE BAKER CLAIM** exploded a blast of 12,000 pounds of Judson powder on the 11th inst., which loosened up gravel over an area of two hundred feet square. The chambers were situated on both sides and immediately in the rear of the shaft. Timbers were placed in the shaft about twenty feet below the surface, and covered with dirt and boulders for the purpose of preventing the shaft from being filled. From beneath these timbers an incline was raised to the surface of the bedrock, for the purpose of opening the shaft. The timbers in the shaft could not resist the concussion, and as was feared, the shaft was filled to the surface with gravel and boulders. A string of pipe, however, was soon laid up the branch tunnel below to the bottom of the shaft, and a stream of water turned on to wash the gravel and boulders away from below. This work has been carried on with vigor, and yet the water has not sunk very deep, and it is to be turned through its pipes until yesterday. The claim is now all right again, and washing to good advantage.

**AT GOLD RUN** everything is now quiet, the only claim running is one owned by Mr. Frank Sachs.

**TUR BIG BONANZA** (as the claim of the Miners Ditch Co. is called) has finished cleaning up since our last issue. This claim has been washing since the first of February, and is the only one that is doing any business. The iron for paving, as they have done, it is not necessary to clean up but once during the season, thus saving much time when water is abundant and time so precious. We have not been enabled to ascertain how much was realized but believe that the amount was large.

**MINING NEAR OPHIR.**—Placer Argus, July 23: Most of the mills in the vicinity of Ophir are now closed. The mine is the property of the St. Patrick mine, and a large number of men out of employment, and it is said that wages are considerably in arrears. The Eclipse mill is running on small jobs for various mines and prospectors in the vicinity. Pelster & Son, who own a quartz claim on Auburn ravine, and Mr. Salmons, whose claim is near Ophir, not far from the Greene mine, have joined forces in the erection of a new mill, which is nearly ready for use. The mill will use it mainly in the reduction of their own ore, though custom work will be taken if offered. The ore from the claims of both partners in this mill pays for working, and it is believed that by reducing it themselves more can be saved than heretofore. Salmons' claim is on an iron belt, containing copper as well as gold. The shaft is down over 50 feet. Pelster's is what is known as the same character of vein, which is quite uniform. The shaft is only 35 or 40 feet down. Peck & White, who are opening a claim near the ravine, about a mile east of Ophir, have a good prospect. This ledge is about four inches wide, and yields enough to pay expenses, though it is surrounded by an iron belt, which is very hard and difficult to work. This vein is two feet thick, and besides iron, contains copper and sulphur. The rock is of the same character as that in the Friday and Greene mines. The hole is yet only 40 feet deep; and as the ledge grows steadily richer, the owners have hopes of final success. They depend now mainly upon select pieces pounded out in a mortar. As soon as the value of the rock will warrant the expense, a tunnel will be run in from the bed of the creek.

## PLUMAS.

**STARTED UP.**—Plumas National, July 25: The new quartz mill at the Bell mine has been started up this week, and works like a charm. The mill is said to be among the best, if not the best, in the county, and the work on it is highly spoken of by those who pretend to be judges of such matters. We expect that the Bell mine will now prove itself a valuable one, and hope that the owners will find that they have invested their money in the right place.

**NICK MILL.**—On Thursday we took a look at the Bell mine, and were shown around by the Superintendent, Mr. R. Z. Bell. The mill runs splendidly. The machinery, under the charge of Mr. Sage, an engineer from Duquesne, seems to perform the duty without an effort, and everything in and about the mill seems to be convenient and practically useful. Mr. Pelton, of Campionville, who has charge of the building business, is certainly a first-class workman, and his work proves it. This mine, which is in charge of our old friend Harry Firmstone, looks first-rate. A cross-cut has been made from the tunnel, and it shows fully 20 feet of splendid looking quartz, besides a large body of vein matter, which carries more or less gold.

## SANTA BARBARA.

**GOLD.**—Santa Barbara Index, July 26: A good deal of excitement has been created by the recent discovery of gold mines about 10 miles from town in the mountains just above Montecito. The gold is found in decomposed sulphates of iron, free from any base metal, and very easily worked. One ton was brought to the mill, and yielded 87½ ounces of the ton gold and \$9 silver. This, if the mines are at all extensive, will give the owners an immense profit, as the rock can be worked for less than \$5 per ton. The same parties have also discovered, it is said, a tin mine, one that will yield \$40 to the ton. If this be true, it is a fortune of itself, as a reward of something like \$150,000 is offered by the U. S. Government for the discovery of a tin mine in the United States that will pay \$18 per ton.

## SIERRA.

**STILL RICH.**—Mountain Messenger, July 23: On Monday last a piece of rock weighing 50 ounces was taken from the North Fork claim. When it was pounded out it yielded exactly 45 ounces of gold. Nine parts gold to one of rock is pretty good.

**GOOD PROSPECTS.**—Dick Williams and Henry Hartling are reported to have struck good prospects somewhere on Thompson ridge.

**AT WORK.**—The Bald Mountain company, after the stoppage of a week, has resumed work.

**TEASO.**—Ward & Brown are making tubing for the Ploocene shaft, and the work of sinking will be commenced immediately.

**PROSPECTING.**—A party of miners from Virginia City, among whom we notice Messrs. R. Jackson, Absalom Wilson and Anthony McKay, old residents of Eureka, are now prospecting in the vicinity of Saddle Back for gravel and diggings. They will also look after some quartz ledges. We are glad to see some of the old miners working back. This is one of the best counties in the State to prospect. A couple of prospectors from below are running a tunnel to prospect the quartz ledge formerly owned by Sam Hartley, just above Jenkins' bridge, half a mile above this place on the South fork. They have started their tunnel at the edge of the river. Sam found some excellent rock in his tunnel above.

## TRINITY.

**LARGE SALES.**—Trinity Journal, July 23: Two large pieces of property have changed hands recently, the Hocking brothers having disposed of their claims and water right, and the W. D. & H. M. Co. of the Sidney gulch and hill property. The purchasers in each case were Chinese. We can't say that the general public will receive any benefit from those transactions. Chinese are not a very desirable kind of population, and the community could expect to reap more benefit if the claims had been retained under the ownership of white men.

**RICH.**—Late specimens from the Deadwood quartz district show much free gold.

## TUOLUMNE.

**BIO GERSE.**—Tuolumne Independent, July 23: As an old German, known by many as "Old Charlie," was looking over some old tailings, near John Victor's ranch, Shaw's Flat, he saw a small piece of gold, and in picking it up, it fell down among the rocks, removing some of the dirt he came upon a piece weighing 17 ounces solid gold. The piece looks as if some one had thrown a ladleful of molten metal upon the ground. It evidently came originally out of Table mountain, and must have been forked out with the rocks from the sluices where the claim was worked some years ago.

**MINING ENTERPRISE.**—Mr. Leachman, of the Solsby, is opening out the Draper mine, which is considered by most reliable parties as being the richest in the county. Mr. Leachman being anxious to see the bottom of the Draper, has concluded to take the water out with barrels and not wait for pumps and iron work which will connect it with the water wheel. He has also commenced opening out the Louisiana, and from reports this property will prove to be one of the first-class mines of the county. He is also pushing the Ferguson with vigor and building a large wheel to carry the works.

## Nevada.

## WASHOE DISTRICT.

**COS. VIRGINIA.**—Gold Hill News, August 1: Daily yield, 500 tons of ore, keeping the mills crushing to their full capacities and insuring the payment of the regular monthly dividend of \$2 per share. The ore stopes on the 1000-ft level are opening out splendidly as the extraction of the ore progresses southward. Sinking the double winze below the 1550-ft level is making fair progress, the entire bottom being again in good ore. The flow of water in this winze, which heretofore has given some trouble, appears to be gradually lessening. The main south drift on the 1550-ft level is being pushed ahead and enlarged to create a better circulation of air. The ore stopes on the 1000-ft level are opening out splendidly as the extraction of the ore progresses southward. Sinking the double winze below the 1550-ft level is making fair progress, the entire bottom being again in good ore. The flow of water in this winze, which heretofore has given some trouble, appears to be gradually lessening. 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## THE ENGINEER.

## Berlin Pneumatic Dispatch.

We read in the *Journal of the Franklin Institute* that the proposed pneumatic dispatch in Berlin embraces 26 kilometers of tube, and has 15 initial stations. The wrought iron tubes have a clear breadth of 65 millimeters, and lie about one meter below the surface of the ground. The letters and cards which are to be forwarded have a prescribed size, and are enclosed in iron boxes or cartridges, each of which can hold 20 letters or cards. In order that they may pack closely, they are covered with leather. From 10 to 15 cartridges are packed and forwarded at a time; behind the last cartridge is placed a box with a leather ruffle, in order to secure the best possible closure of the tube. At four of the stations are the machines and apparatus needed for the business. The forwarding of the boxes is effected through compressed or rarefied air, or through a combination of the two. Steam engines of about 12-horse power are used for the condensation or exhaustion of the air. Each main station has two engines, which drive a compressing and an exhausting apparatus, the steam for each engine being furnished by two boilers. Large reservoirs are employed, both for the condensed and for the rarefied air. The former has a tension of about three atmospheres; the latter of about 35 millimeters of mercury. The air, which is heated to 45° C. by the compression, is cooled again in double-walled cylinders which are surrounded by water. The velocity of the boxes averages 1,000 meters per minute, and a train is dispatched every 15 minutes. Each of the two circuits is traversed in 20 minutes, including stoppages. The entire cost of the enterprise will be about 1,250,000 marks.

**MECHANICAL ENGINEERS.**—Mechanical engineers seem to be better appreciated on English railroads than on ours, says the *Railroad Gazette*. In connection with a notice of the appointment of a successor to Mr. Joseph Armstrong, late Chief Locomotive Superintendent of the Great Western railway, it is stated that the salary of the position is £1,500 a year—equivalent to a little more than \$7,500 in our currency. Moreover, after Mr. Armstrong's death, the company voted his widow a gratuity of £1,000. No master mechanic in the United States, it is safe to say, gets a salary anything like this. Very likely, too, some of our roads would be better off if they had a \$7,500 man at the head of their mechanical department—if they could find one. Certainly it cannot be expected that the best talent will devote itself to or remain in this department (where first-class ability is so much needed), unless it offers some great prizes as well as many little ones. Too many railroad companies seem to regard master mechanics as intelligent blacksmiths, who ought to know how tools are used but have no great need of brains or education. They are not, in the long run, likely to get much better material than they ask for—and pay for.

**AN ENGINEER HONORED.**—The *New York Engineering Journal* learns that the Emperor of Germany, in acknowledgment of the services rendered to German engineers visiting this country, by Mr. William G. Neilson, Secretary of the Centennial Committee of the American Institute of Mining Engineers, has conferred upon that gentleman the fourth class of the Royal Order of the Red Eagle, the decoration of which (a handsome silver Maltese cross, ribbon, etc.), together with a suitable letter from Baron Thielmann, the German charge d'affaires at Washington, came to Mr. Neilson's hands last week. This graceful recognition is in keeping with the cordial spirit in which the German government and its representatives have from the beginning accepted the courtesy and assistance, which the institute was able to render. Mr. Neilson was, however, far more than a mere official representative of the institute. It is not too much to say that he made himself the personal friend of every guest of the institute who needed his services, and that he deserves a large part of the credit which the successful execution of the plans of the Centennial Committee has reflected upon the society.

**RAILWAY THROUGH EDEN.**—The scheme of making a shorter route to India, by constructing a railway along the valley of the Euphrates, appears to receive a good deal of attention at present. The project is no doubt a fascinating one, but the difficulties in the way of such an undertaking are, however, enormous, if not insuperable. That the line, if accomplished, can be anything more than a military road for British troops, few who know anything of the country will contend. The climate may be described as deadly, and what was once a vast fertile garden, teeming with life and industry, and having a magnificent system of irrigation, is now an arid waste, traversed only by bands of plundering Arabs.

**CANADIAN CANAL.**—The work on the Welland canal, enlarging it to the capacity of vessels of the largest class, will not be completed before the fall of 1879. When completed, it will have locks 278 feet long and 45 feet wide, with 14 feet depth on the sills, the canal proper having a width of 100 feet at the bottom, with a depth of 15 feet. Vessels of over 2,500 tons burden will be enabled to pass through.

## Asiatic Railway Routes.

From the journal of the Vienna Imperial Geographical Society, 1876, we see that M. Hochstatter, the President, has recently published a brochure on these routes, some of which projects are as follows. They will give our engineers a chance to study the magnificent in projecting:

1. Baranowski project.—Point of departure, Saratow; direction across the country of the Triguises, the length of Amou-Daria across the Hindoo Couch, which would be the shortest line from Moscow to Peshawer.
2. Project.—Lesseps-Cotard; from Orenberg to Peshawer by Orsk, Tachkend, Chodchend, Samarcand and Balch.
3. Project.—Bogdanowitch, frontier of Siberia stations, Moscow, Cazan, Catherinobour, Onisk, Tonisk, Irkuck, Tchita, Dalai-Noor, Peking.
4. Project.—Ruhthofen; junction with the route of Siberia to Onisk (Semipalatinsk), Sugipol, defile Kastew, Tachkend, Chodchend, Samarcand and Balch. At this last point the route turns toward the west by Wechek and Teheran to join at Tiflis, the Russian Caucasian *Reseau*, presently in course of construction. Last geological explorations have proved the existence in Central Asia of immense depots of *Combustible fossils*.

**FAST TRAINS SUGGESTED.**—The *Railway Age* says it has been suggested, and not without some reason, that the Union and Central Pacific Railroad Companies might imbibe a little of the fast train mania to real advantage. At present the time spent by the express train from Omaha to San Francisco is something over 102 hours for the 1,916 miles, or an average of a little over 19 miles an hour. If the speed was increased to an average of 25 miles, the long journey would be reduced fully twenty-four hours—a very important saving to travelers on business, and one that would not be at all unwelcome to pleasure tourists. It is true that a considerable part of the distance is over heavy grades, but there is also a very large proportion of level road, and the proposed time could easily be made—especially on the completion of the loop line from Bantuas to Oakland, which will save about two hours over the present route. Of course the increased speed would be somewhat more expensive, but it might pay nevertheless. Certainly if another transcontinental line is ever opened we shall be likely to see the present line shortening up its time-table, and it is not impossible that the trip from the Missouri to the Pacific may yet be regularly made in two days and a half instead of nearly four and a half as now.

**THE OLD CABLE.**—An English paper says: "Persons interested in cable companies will be astonished to learn that there has just been picked up in mid-Atlantic the long-lost cable which was laid by the Great Eastern steamship twelve years since. The successful laying of that cable was hailed with rejoicings in the New World and the Old, for though an earlier cable had been partly laid, the cable of 1865 was the first which had actually transmitted a message from the other side. But that cable soon broke, and was completely lost for the time. The Telegraph Construction Company sent a steamer recently to fish for the old cable, and a message received through the identical line the other day states that the cable has been recovered in the middle of the Atlantic in good condition. The Anglo-American Company intend to have the line completed and got to work as soon as possible, and this will make the fourth cable of the Anglo American Company."

**RECLAMATION OF LAND IN MORECAMBE BAY.**—A scheme has been originated, says *London Iron*, and is in fact being carried out, under the auspices of the Warton Land Company, for the reclamation of about 10,000 acres of land from Morecambe bay, by the construction of a sea wall to extend from Hest Bank railway station on the London and Northwestern railway to Arnside point. It is proposed to construct a drive between Morecambe and Arnside, and the possibility of a railway connection across the new bank is talked about. When this work is completed the distance between Lancaster and Barrow will be reduced by 10 or 12 miles. The estimated cost of the work is £150,000, and it is thought the land when reclaimed will represent a value of £400,000.

**LIGHTING TUNNELS.**—We learn that the managers of the Hoosac tunnel are considering the feasibility of lighting that great subterranean work, so as to remove the gloom attendant on a ride of thirteen minutes through its blackness of darkness, and to give the traveler a better idea of this wonderful passage, four and three-quarter miles long, hewn through the mountain at a cost of nearly \$17,000,000. The problem of lighting so vast a gallery throughout its entire extent is a difficult one and will require some study.

**COSTLY BRIDGE.**—The trustees of the Brooklyn bridge, crossing East river, between New York and that city, at their meeting on July 24, stating that thus far \$7,557,135 have been expended upon the bridge, the balance on hand being \$154,147. Two strands in the bridge cable were completed July 24, containing respectively 324 and 326 wires. The only other bridge in the United States as costly as this is the great railroad bridge across the Mississippi at St. Louis, in which about \$10,000,000 are invested.

## An Army of Miners.

A *Chronicle* reporter was detailed a few days ago to ascertain as nearly as possible the number of miners employed on the Comstock. The following figures, which were furnished by the accountants named, are accurate. The names of the companies are stated in the order in which their claims occur on the lode:

Utah.....	46
Sierra Nevada.....	120
Union Consolidated.....	25
Mexican.....	42
Ophir.....	222
California, Con. Virginia, C and C shaft.....	1160
Best & Belcher.....	27
Gould & Curry.....	100
Savage.....	100
Hale & Norcross.....	54
Chollar and Combination Shaft.....	110
Bullion and Exchequer.....	50
Imperial.....	74
Yellow Jacket.....	168
Crown Point.....	87
Belcher and pump shaft.....	220
Overman.....	70
Caledonia.....	40
Justice.....	59

The Julia, which is located on the problematic "east ledge," employs 32 men.

The above, although it includes all the mines on what is recognized as the Comstock lode, is by no means a full report of the number of men employed at mining in the neighborhood. There are many smaller claims which give employment to from two to ten hands, which are not mentioned at all. Setting the total of such at 150, it will be seen that the whole number will reach 3,156. Of this number, exactly 1,800 are employed in the Utah, Sierra Nevada, Union Con., California, Con. Virginia, Best & Belcher, Gould & Curry, Savage, Hale & Norcross and Yellow Jacket mines, which are now controlled by the honanza firm; 806 are employed in the Mexican, Ophir, Chollar, Combination shaft, Imperial, Belcher, Overman and Caledonia—controlled by the Sharon or Bank of California party, and 641 in the Bullion, Exchequer and Justice—controlled by the Schultz & Von Bargen party.

The labor prospects are improving slowly, as some of the mines are continually adding to their working force. For instance, although the Ophir, since their last pay day, has reduced its force by about 30 men, the honanza companies have added about 150 to their working force; so that the number at present employed is really above that stated in the table, as the figures there given were taken from the last pay rolls. Within the next 30 or 40 days, the Wells Fargo, Phil Sheridan, North Con. Virginia, Ward, Alpha, Knickerbocker, Baltimore Con., Silver Hill, Dayton, Kossuth, and a score of mines of lesser note, will probably be started up again.

The figures above stated do not include the men employed in and about the mills.—*Virginia Chronicle*.

## Pike City Gravel Mines.

A correspondent of the *Mountain Messenger* (Sierra county), writes as follows from Pike City:

While other localities have been busy puffing themselves on paper and finally bursting, like the toad in the fable, we of classic Pike have been modestly standing on our conscious dignity waiting for our worth to be appreciated, and in consequence have been almost forgotten even by the candidates for office, whose memories are so long and who "love the people all so dearly."

This ridge is the divide between Oregon creek and the Middle Yuba, and there is a comparatively level strip of from one to two miles wide on the top of the ridge. Along this strip are scattered the ranches; foremost in size are Wayman's, Harris's, Clerkin's, Robinson's, Nelson's, Houghton's and several smaller ones. The principal products are hay, potatoes and hutter. There are many indications of prosperity among them showing that a mountain ranch does pay, for instance, the building of new barns and adding to their flocks.

The formation is much similar to the generality of the southern part of the county, except in the number of talcose veins. These veins are very numerous, and cut through and across the formation in as clear and defined a manner as any quartz ledge. In many places they carry gold in paying quantities, generally in streaks of quartz running in every direction through the talc. The quartz ledges have been very little prospected around here, and none except the Alaska to any depth. This mine has been worked to a depth of 225 feet from the croppings and paid big. There was good rock in the bottom of the lower level, but the pump-machinery had got too light to go down. At this time the nine changed hands and the new owners essayed to make it pay by increasing the battery from five to ten stamps, and going after top rock. Since that time the mine has been idle most of the time, except as Mr. Marriott has taken out some patches of ore under a lease, and used the mill part of the time as an artist's studio.

The placers were in early days very rich both in rough and washed gold. They consisted in shallow gulches which were easily exhausted, and then re-exhausted by the Chinese. The class of surface miners who worked out the section of the country, left as soon as the rivers were worked, without much search for the source of gold they found in the grass-roots

and the few who remained turned their attention to ranching.

On the Oregon creek side, is a ridge of gravel mixed at the surface with some quartz boulders. In this ridge the gulches near Pike City all head, and here they probably got their washed gold; yet, for two miles I do not think there is a tunnel or shaft on the ridge. What we want is a revival, and it will surely come. Mining is epidemic, and when it breaks out in a locality everybody goes there and begins to prospect in all the reasonable and unreasonable places, and in consequence several good mines are always found soon after some emigrant blunders on good pay.

## A Marvelous Winze.

There is a great mine on the Comstock. It has for some years been a matter of deep concern to many people. We may say the concern commenced when people had loaded up on margins at \$243, and suddenly the bottom fell out. That bottom was the matter then; it seems to be yet. The story goes that some 10 days since a winze was being sunk, when the same treacherous body showed painful signs of a change to a formation which is not considered the best for holding treasure. Then the work was stopped. With laborious effort water—though water is scarce—was brought and the winze was filled to the depth of five feet. Just then a prominent expert was desirous of visiting the mine. On the top he was told about the winze and the sudden inflow of water. The account was rendered in a tone of regret, which did not succeed in concealing the sorrow of the managers that such an unlooked-for obstruction should come up in their path. But to show him what would have been but for the catastrophe, he was lowered down to the top of the winze; a brave miner was armed with a giant cartridge, and was besought, if possible, to get some ore from the very bottom. He was a good miner, the charge was successfully exploded, and, on his second journey, the miner, out of five feet of water, brought up the ore. The expert who had waited, clutched it, assayed it and reported by telegraph that it was three hundred and odd dollars at the bottom of the wet winze. The stock went up \$2.50 per share and was steadily advancing when it was discovered that the treacherous bottom had deceived the people again—the water had seeped away. This was too bad. When the story was reported to a distinguished Superintendent, and he was asked what would be a fair conclusion of the whole business, he said it was the most ungrateful winze he ever heard of; that the mistake was made in using water; that in Justice to the mine lager beer should now be tried. There is no point to the above except that it is vouched for as true and reveals a system which we thought was confined to White Pine in the early days, when a Superintendent there asked a man, whom he caught stealing Eberhardt \$30,000 rock, if he could not get along with less than a full sack. "Not a d—d ounce less," was the reply; "I have got to sell a claim with this sack of rock."—*Virginia Enterprise*.

## Osceola District.

The *White Pine News* says: At Osceola, the five-stamp mill of Wagner, Peck & Co. is constantly working on Exchange ore with satisfactory results. Our informant rode some six hours over the district and saw a number of good leads; principal amongst them are the Cumberland, which is a five-foot vein, owned by Mr. George Blair, who, several years ago, worked his mine with an astra, making it pay. This was before the placers were struck. Other promising mines are the Exchange and Golden Eagle, owned by Mr. James Mattison, the former being leased by the mill company. The Woodman, owned by Peters & Irvine, and the Gilded Age, owned by Watson & Barrows, are well-defined ledges, about four feet wide, and show free gold to the naked eye. The fact that every little gulch around will pay wages in coarse gold is inducement enough to develop this district. Some of these gulch claims are paying well. Wizer & Chappel are making \$12 per day to the man, and a number of miners are taken out from \$6 to \$7 per day. Others make good wages by cleaning up the bedrock and packing the dirt to water. These gulch claims extend about five miles in length and would pay big for one season if a good stream of water was convenient to the camp. There is a scope of country, about four miles wide by six in length, in which appears principally quartzite, with an under strata of slate and some porphyry, the general direction of the country rock being north and south, while the quartz veins cut the same at an angle bearing about 20° south. The place has already attracted the attention of capitalists, and Mr. Sam Ferguson, a mining expert, has spent several days in examining the mines. The business of the town of Osceola is represented by two saloons, two restaurants, two butchershops and one store. Many old White Piners are located there, and vie with others in the description of their claims. Several of the natives were asked the population of the place, but they varied from 150 to 500. There are probably 100 men in the vicinity. A good road leads from Osceola to Snake valley, from which are brought new potatoes, fresh vegetables, trout and other delicacies.



## Mining at Iowa Hill.

A correspondent of the Dutch Flat *Forum*, writing from Iowa Hill, says: Our mining interests promise to have an impetus given them this summer, such as they have not had for a long time during the dry season. First I will speak of the

## Succor Flat Claim.

This is an old claim, under new and extensive operations, being now the entire property of Mr. Weske, of Michigan Bluffs, who has spent a large sum of money to put the claim in its present condition. Two tunnels are being run simultaneously; the lower one is already 900 feet long, and intended for general working purposes; the upper one, which commences at the chute connecting the two, is about 170 feet long, and intended eventually to secure good air. From the upper tunnel, some gravel, for the first time under this management, has recently been washed, and though not rich as of old, may still be considered satisfactory. The larger pieces of gold are mixed with quartz, and quite rough, as though just broken from the parent ledge, so it is probable this gold does not come from the old channel they are seeking to strike. In richness, also, this gravel bears no comparison to that washed years ago by the original owners, before they lost the bottom in their slope and were driven out by water. The rock, however, is dipping rapidly in the upper tunnel, and things look as if they had not much farther to run before the old rich pay is again reached. It is to be hoped this will prove so, for the claim is very important to the district, representing as it does a large tract of unprospected ground. The outer works, consisting of shops, sheds, tracts, dumps and flume, are allowed to be the largest and most substantial in the county, and at a rough estimate must have cost \$4,000, while a similar amount must have been expended on the inside works.

The next feature of improvement during the summer will be fixing up the

## Orion

For the pipo. This is a large hydraulic claim, situated at the entrance of the town, on the Colfax road; and, though worked successfully in past times by tunnel, has been in abeyance for years. Like the Succor Flat claim, though in a different way, the Orion will have an immense influence on our future. It is not only a very large claim, comprising, I believe, the whole of Sugar Loaf hill, but possesses unequalled facilities for extensive washing on both the river and Indian canyon side. Mr. Macy, one of the owners, and a deservedly popular man in our section, has taken the contract at \$5,000. This fact assures us the work will be done thoroughly. When in full operation the Orion will be quite a feature among our big mines, while its developments will do much to establish our prosperity in future, beyond reverse.

The next and last item is the sale of the old Rough and Ready claim, situated at Grizzly Flat, between two and three miles from Iowa Hill. Report fixes the figure at \$2,200. In connection with our general interests and future reputation, it is almost impossible to over estimate the importance of this sale. The claim originally bore a high reputation; but, owing to disagreements among the owners of the day, the large works were dismantled and the ground left idle up to this date. As stated, the present owners, Mrs. Liddell and Mr. Geo. Hazelroth, have sold to Messrs. Powers, Cameron and Jurgenson, owners of the Hidden Treasure at Sunny South, one of the crack claims of the county. If the warmest friends of our district had had the choice of purchasers they could not have made a better selection. These gentlemen have not only the means, but they have the true mining intelligence, enterprise, and courage to make the undertaking an immediate success. In fact, I do not know where to limit reasonable expectations from this sale. Although extremely rich in olden times, neither the precise course nor extent of the channel northward, which the claim commands, had ever been actually determined. Sufficiently defined ideas, however, of both exist from past experience to justify a prediction of developments which must have an immense influence on our future. The secret we have long wanted know, and which a revival of the Rough and Ready will disclose, is the precise course and character of the enormous channel which beyond all question intersects this particular territory. Does it extend to the Mohawk, four miles to the north; will it eventually, in that direction, connect with Succor Flat; has it diverged to Prospect hill, a mile and a half to the west, or did it preserve itself unbroken, and pass by Rough and Ready to the junction of the Big and Little Grizzly canyons, two miles to the south? Here then, we have a territory six miles long, and a mile and a half wide, giving unmistakable evidences throughout of an immense channel, and rich wherever hitherto touched, to be definitely explored by the operations of this new company. Have I attached too much importance to a revival of the old Rough and Ready; to my anticipations of good to spring from its reopening in a manner that will solve this great problem? I have every confidence in the natural evidences before us; I have equal confidence in the men who are now going to grapple with those evidences; and, in the two, I feel safe in predicting a speedy emergence of our district from stagnation and idleness, to the wealth and activity of your own surroundings. Such are the prospects the present summer offers, the best of prospects, employment for the working man.

## USEFUL INFORMATION.

## Removal of Stains from Woven Fabrics.

The following practical hints on this subject, condensed by the Boston *Journal of Chemistry* from the best foreign sources, furnish much useful information in small space:

Mechanically attached particles may be removed from all fabrics by beating, brushing and allowing water to fall from an elevation upon the wrong side of the goods.

Mucilage, Mucus, Sugar Jelly. — Washing with lukewarm water will clear all goods.

Fats. — From white goods: Wash out with soap and lye. Colored cottons: Wash with lukewarm water and soap. Colored woollens: Lukewarm soap and water or ammonia. Silks: Clean carefully with benzole, ether, ammonia, magnesia, chalk, clay or yolk of eggs.

Oil Colors, Varnish, Rosin. — From all fabrics, except silks: Oil of turpentine, alcohol, benzole, and then soap. Silks: Benzole, ether, and soap very carefully and in a very weak solution.

Stearine can be removed from all goods with strong, pure alcohol.

Vegetable Colors, Red Wine, Fruits, Red Ink. — From white goods: Sulphurous vapor or hot chlorine water. Colored cotton or woolen goods: Wash in lukewarm water and soap or ammonia. Silk may be treated in the same manner, but very cautiously.

Alizarine Inks. — From white goods: Tartaric acid; the older the spot the more concentrated. Colored cottons or woolen goods: If color permits, dilute tartaric acid. Silks: As before, but with great caution.

Blood and Albuminous Spots. — Simply washing out with lukewarm water for all kinds of goods.

Rust, and Spots of Ink made of Nutgalls. — From white goods: Hot oxalic acid, dilute hydrochloric acid and then tin filings. Colored cottons or woollens: Citric acid may be tried. White woollens: Dilute hydrochloric acid. Silks: Nothing can be done without increasing the evil.

Lime, Lye and Alkalies in General. — From white goods: Simply wash in water. Colored cottons, woollens or silks: Much diluted citric acid, drop by drop upon the moistened spot, to be spread around by the finger.

Acids, Vinegar, Sour Wine, Fruit Juices, etc. — From white goods: Simply washing; in the case of fruit, also with hot chlorine water. Colored goods, either cotton, wool or silk: According to the delicacy of the material and the color, more or less diluted ammonia, to be spread around on the spot, moistened, drop by drop, with the tip of the finger.

Tar, Wheel-Grease, as also Fat, Rosin, Carbonaceous Particles and Wood Vinegar. — From white goods: Soap with oil of turpentine, varied with the action of falling water. From colored cotton or woollens: Hog's lard to be rubbed on, and then soaped and allowed to remain quietly, then washed alternately with water and oil of turpentine. From silks: As in the preceding, but more carefully, and instead of turpentine benzole and a continual current of water falling from a height, and only upon the reversed side of the spot. For cleaning silks, soiled and greased, but not thoroughly discolored by acids, etc., the best agent is ox-gall, diluted with lukewarm water and strained. Blood and albumen should simply be soaked in cold water.

Superficial Loss of Substance by Scorching. — For white goods: Rub over thoroughly with a pad dipped in hot chlorine water. Colored cotton or woollens: Whenever possible, color over or raise up the nap. With silks nothing can be done.

## DEEP WALNUT STAIN FOR LIGHT WOODS.

The employment of alkaline manganates for staining light wood in furniture and floors a beautiful, uniform and durable walnut brown is highly recommended by Viedt, as noted in the *Journal of Chemistry*. The action depends upon the decomposition of the salt in the pores of the wood, with the separation in them of very finely divided brown hydrated peroxide of manganese. In practice, addition of magnesia sulphate to the solution hastens the reaction. The process may be conducted as follows: Dissolve equal parts of manganate of soda and crystallized Epsom salt in 20 to 30 times the amount of water, at about 144° Fahr., and brush the planed wood with the solution. The less water employed the darker the stain, and the hotter the solution the deeper it will penetrate. When thoroughly dry, and after the operation has been repeated, if necessary, the furniture is smoothed with oil and finally polished. It is well to wash it with hot water before smoothing to prevent the efflorescence of the sulphate of soda formed. For floors the solution may be employed boiling hot, and if the stain is not dark enough, a second application of a less concentrated solution should be made. After it is perfectly dry, it should be varnished with a perfectly colorless oil varnish. On account of the depth of penetration of the stain a fresh application will not soon be required.

AMERICAN INSTITUTE EXHIBITION. — The 46th exhibition of this institute will open September 12th, in New York city. Parties having novelties which they intend to bring to public notice should at once address the general Superintendent for blanks and information. The medals, it is said, have been increased, and special awards will be made upon a number of articles.

QUICK TIME AROUND THE WORLD. — The Omaha, Neb., *Republican* prints a letter from Dr. F. S. De Hass, American Consul at Jerusalem, in which he gives an account of a tour he has lately made around the world in 68 days of actual traveling time. The letter is dated at Jerusalem, May 10th, 1877. The outline of the journey we quote, greatly condensed, is the following: "Having safely returned to my post I take pleasure in furnishing your readers, agreeably to promise, with a brief notice of my quick and successful tour around the world. Not counting the time I lay over at different points, as these breaks in the journey could all have been avoided, I made the entire circuit of the globe in 68 days, and but for heavy weather on the Pacific would have made it in 62 days. The journey from Alexandria, Egypt, via Brindisi and Paris to London, and from thence to New York and San Francisco, was accomplished in 20 days, and we were just the same number of days going from San Francisco to Yokohama, Japan. Crossing over from here to Canton, in China, took six days. A sail of 10 days over the China sea and through the Strait of Malacca, touching at several points we have not time to notice, brought me to Ceylon, off the southern coast of Hindostan, and one of the richest of the East India islands. Thence we sailed directly to Suez, in Egypt, which took 12 days, and from thence, in a few hours, by rail to Alexandria, our starting point, making the entire distance of 25,000 miles—16,000 by water and 9,000 on land—in 68 days, without any accident or detention of any kind."

GLYCERINE FOR OIL STONES. — Almost every one has more or less use for an oil stone, but in these days a good oil is hard to obtain, and kerosene is often used instead. This is a bad plan, for although it makes the steel "take hold," it ruins the stone. Glycerine is much better, does not dry on the stone, and is easily washed off when dirty. Use soap or soda and water to clean the stone, and then apply the glycerine. Clean water is only needed to wash the stone with, and if treated in this way it can be kept bright for a long time with the grit unimpaired.

THE DEEPEST WELL IN THE WORLD. — The Warren farm well, says an English paper, one of the deepest, if not the deepest, dug wells in the world, was commenced on the South Downs above Brighton in 1858, and after four years' persistent digging the water was reached at a depth of 1,285 feet, the shaft being six feet in diameter down to 400 feet and four feet for the remainder. The operation cost between £6,000 and £7,000, and was watched with the greatest interest by geologists.

COLORLED LEAD PENCILS. — Red, brown, green and other colored lead pencils are made by bringing kaolin or pipe-clay to a doughy consistency with water, and then mixing the mass in a paint-mill with an earthy or metallic pigment of the color desired.

## GOOD HEALTH.

## Hints for Bathing.

Dr. W. H. Vail, well known as one of our best medical writers, gives the following sensible suggestions on this subject in the *Christian Union*:

Whether in bath-tub, river or ocean, bathing should be accompanied only by pleasurable sensations. The whole body should be kept aglow. If any shiverings or chilly sensations are experienced, either you are not well, the water is not of the right temperature, or you are bathing too long. At all events, such feelings are nature's warning that you should at once leave the water and give yourself a thorough rubbing with a coarse towel. Bathing, especially swimming, necessitates great muscular activity, therefore in order that digestion may not be interfered with, at least one hour, and better still two or three, should elapse between a hearty meal and bathing. It is easily seen that 11 in the forenoon, four in the afternoon and just before retiring at night are the best times for bathing.

Some like a cold dash on rising in the morning. Very few, comparatively, can stand such a shock to their nervous systems. Let those who enjoy it, and experience a glow during the operation, continue the practice; but let them be careful how they urge its adoption upon those whose nerves possess a less degree of resistance.

Any one desiring to acquire the habit of a cold bath every morning should begin the custom in the warm weather, continuing it during the winter, and not commence it in the latter season.

If you are perspiring from walking, rowing or other exercise, as you reach the place of bathing do not (as some advise) sit down on the bank to cool off before entering the water. Doff your clothes and dash in as soon as possible, only being careful to keep up the exercise without intermission after you are in the water. In this way you continue the glow which you experienced from the previous exercise.

Ten, or at longest 15, minutes in the water should suffice for the strongest aqueously inclined urchin. Strive always to leave the water before you feel chilly, or certainly at the first approach of any such sensation, and continue or rekindle the glow by a vigorous rubbing with a coarse towel.

## Watermelons as a Medicine.

It seems that watermelons have become out of patience of being considered the occasion of medicine giving and have assumed the role of doctor. Byron Tyson writes the following from Washington to the *Marysville Appeal* for the encouragement of watermelon growers and the prevention of ague: Watermelons are a mild aperient, and if eaten regularly, say at least once a day during the melon season, they will serve to keep the bowels free and easy, and so long as the howels are kept in that condition there is not much danger of disease. But if they be eaten irregularly, say extravagantly for two or three days, and then none for two or three days, the bowels become costive and sickness is the result. During July, August and September last I was located in one of the mining towns of California where no melons were raised nearer than about 20 miles. Notwithstanding the distance we had to haul them I generally managed to keep a good supply on hand. On one occasion, however, they gave out, and for several days I had none. I expressed myself to the effect that I was fearful I would have a chill. Sure enough in a few days I had one. I, however, soon received a supply of melons, and by indulging freely, with the aid of a proper diet (consisting largely of canned oysters and vinegar) I was soon all right without the aid of a particle of medicine. Previous to the time referred to I had never during the melon season, for 20 years or more, been without a full supply, rarely passing a day without partaking of them one or more times. During said time I never had a chill. Now it would seem that if they would induce sickness, such as fever and ague, as has often been alleged, I would during a period of 20 years or more have had some experience in that line. If eaten irregularly they will doubtless produce diseases of the character mentioned; but if eaten regularly I do not believe a better preventive of the aforesaid diseases can be found. I therefore advise people, especially those in fever and ague districts, to eat and spare not. Then see if at the close of the present melon season they will not coincide with me in the foregoing opinion.

DRINKING IN GREAT BRITAIN. — Mr. R. F. Mushet, of England, is a prominent advocate, in Great Britain, of the principles and practice of total abstinence. He contends that the drinking habits of the laboring classes in that country, and not the hard times, are dragging men, women and children down into abject poverty and distress. Certain statistics which he has given in *Ryland's Iron Trade Circular*, of a late date, are well calculated to set thoughtful people to reflecting. He compares the traffic in the two leading articles, coal and iron, with the trade in intoxicating drinks, with the following result: "The sales of coal in 1876 amounted to about £100,000,000 the sales of iron to about £40,000,000; the sales of intoxicating drinks to £147,000,000, £7,000,000 in excess of the joint sales of coal and iron." That is, the people of Great Britain consume more in useless and injurious drinks than they and all their customers in the whole world consume in goods made of iron and the useful and necessary item of fuel! What is true of Great Britain is also probably true of this country, though we would foudly believe that Americans are a little less addicted to drinking habits than our British consins.

ELIXIR OF EUCALYPTUS. — Every one knows that it is claimed that there is heating virtue in the leaves of our abundant eucalyptus trees. We can tell how to put it into available form but we do not know how to use it. E. M. B. gives *New Remedies* the following formula:

Eucalyptus leaves..... 4 Troy oz.  
Alcohol, 86 per cent..... q s.  
Oil Orange..... 3 ij.  
Oil Cinnamon (Ceylon)..... 3 ss.  
Sugar..... 3 lbs.

Reduce the eucalyptus leaves to a coarse powder, add the oils to 1½ pints of alcohol, moisten the leaves with a portion of this menstruum, and pack it in a percolating funnel. Pour on the remainder of the alcohol and percolate 1½ pints of tincture, using if necessary, an additional quantity of 85 per cent. alcohol. Add the sugar to the mixture and make the product measure two pints by adding more alcohol. If alcohol should be objected to, a distilled water may be prepared from eucalyptus leaves, which may be flavored and sweetened as above.

THE POSSIBILITY IN LIFE. — It is estimated that, as a general rule, the length of an animal's life is five times the period of its growth to maturity. According to this estimate, the natural age of man would be about one hundred years. The fact that this age is sometimes attained, shows that it is within the capabilities of the race. But the facts that not more than one in 10,000 do reach it, that more than one-half of all who are born die before reaching maturity, that the average age to which men live is less than forty years, and that the great majority of men hardly know, by actual experience, what vigorous health really is, would seem to indicate that there must be some deleterious influence at work to thus cut short the days of man, and entail upon him so much misery, especially since this great premature mortality is reserved for him alone of all the animal kingdom. What these deleterious influences are can only be ascertained by making the human constitution our study, and subjecting our habits and modes of life to the test of the laws which we find inscribed therein.



# MINING AND SCIENTIFIC PRESS

W. B. EWER, SENIOR EDITOR.

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THE ORIGINAL ARTICLES in this paper are mostly set in solid type, giving in our columns one-third more reading than is contained in ordinary leaded matter.

Our latest forms go to press on Thursday evening.

SAN FRANCISCO:

Saturday Morning, August 4, 1877.

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## The Week.

The excitement of last week with regard to the riots has calmed down to a great extent, although care is being taken to prevent a repetition of the scenes we referred to in our last. The Mayor of the city has offered a reward of one thousand dollars for information that will lead to the arrest of incendiaries, and orders have been issued to shoot on the spot any one detected in the act of firing a bulling. In the Eastern States affairs are comparatively quiet, although trouble is brewing among the Pennsylvania miners, who have broken out on a strike.

The suit of the Eureka Consolidated mine vs. Richmond, is still on trial in this city, and a number of experts have been examined. A great deal of the testimony has been interesting, but of too great length for us to transfer to our columns.

C. L. Weller, President of the Mexican and Ophir companies, has created a ripple of excitement in Virginia, by giving notice that all miners boarding at Mrs. Cooper's should leave the place or be discharged inside of ten days. Hereafter, he pledges that miners shall get work on their merits, and independent of the boarding houses. He will also adopt the check system of paying, so that the clerk will not pay silver and make the discount, and no houses giving a commission to those purchasing supplies will be allowed to furnish material for the mines under his management. These orders are called out by the investigation in the companies referred to, and the suspension of Mr. Curtis as Superintendent of the companies.

## Corporate Speculation.

Speculation is by no means confined to individuals in this country or in Europe, but in these days of joint-stock companies, the speculative corporations throw the individuals into the shade. Railroad and mining speculations are well known among us, and in England the companies go into all sorts of schemes, some of which are devised for the special purposes of getting up companies, more than the companies are formed for getting up the schemes. A thousand examples might be cited if necessary, but so many instances may be recalled by any one that it is scarcely worth while.

Americans have generally been credited with the most shrewdness in organizing speculative or absolutely fraudulent companies, so that the impression prevails in some quarters that we do the most business in that line. This, however, is not the case. In England, where everything is reduced to statistics, it is found that an alarming number of mushroom companies have been formed and come to their natural end, while others still exist and others again continue to be formed. In proof of the facility with which limited liability companies are floated in England, the London Mining Journal says that a return has just been issued by order of Parliament, showing the number of joint-stock companies which have at any time during the seven years, ending December 31st, 1875, failed to make the annual return required by the Companies Act, 1862. There were for 1869, 2,846 companies; for 1870, 3,040 companies; for 1871, 3,345 companies; for 1872, 3,608 companies; for 1873, 4,021 companies; for 1874, 5,666 companies, and for 1875, 5,233 companies, so that these limited liability companies grew with great rapidity. The total number of defaulting companies was 5,793, and the number of companies which failed in every one of the seven years was 2,747. The failure of such a large number of these public companies is proof of the reckless manner in which their affairs were conducted, and the competition evoked thereby with old-established firms must have been most ruinous to fair and legitimate trading. The too great readiness with which gentlemen of standing attach their names to prospectuses of companies, of which they know nothing, had been one of the principal means by which many of these chimerical schemes have been floated; and in the interest of commerce generally it is necessary it should be stopped.

This, from a leading mining and commercial English paper, shows to what a state of affairs this reckless corporate speculation has led. The Journal further says: "It is unfortunately too true that during the past four or five years there has been a good deal of reckless speculation, and the numerous limited liability companies which have shot up in our midst with mushroom rapidity have proved most inimical to commercial morality and sound trading. Many of these schemes bore upon their face the evidence of mere illusory bubbles, which the first adverse breeze would scatter to the winds, and effectually dissipate the money which had been invested by the too credulous capitalist. Many others, however, bore the impress of bona fides by the weight and authority of the names attached to the directorate, and although it was known to the initiated that these names were mere ornaments, such information was not possessed by the public generally, and the consequences is that many investors (it may be of very limited resources), were drawn into meshes from which it was difficult to escape, by which they lost considerably."

In connection with this matter of "ornamental directors," we learn from the same paper that a salutary lesson has just been taught by Vice-Chancellor Sir James Baron: "It is a well-established fact that in several instances which have come before the English courts, large numbers of shares have been given and accepted by gentlemen in order to qualify them as directors. By accepting these shares it is evident that the recipients were quite prepared to accept any profits which might accrue, and the Vice-Chancellor in his decision has decided that they must also accept the responsibilities and risks of their actions, and be answerable by any loss sustained, and for the expenses incurred. When this legal and just decision shall become more generally recognized a better state of things will be established, and these decisions of the court must be hailed with satisfaction by all who are desirous of seeing the commerce of the country based upon a sound and permanent foundation."

**A GAIN FOR THE EAST.**—After two and a half years of earnest and faithful work in the important post of proof reader for the PRESS, Mr. William Henrici has withdrawn from our little world and returned to his home in Pittsburgh, Pa., to regain the strength which has been hazarded by close application. To Mr. Henrici the PRESS has been greatly indebted for the typographical accuracy which has characterized the paper. He departed from us bearing tokens of our regard for him. We can but wish that the fullest health may return to him and he to California.

THE Bannock Indians, Montana, have been committing depredations and murders on the Salmon river.

## Our New Peril.

The excitement attendant upon the riotous proceedings in this city, last week, has subdued without causing an entire cessation of the extra vigilance incited thereby on the part of the regularly constituted authorities and the better class of citizens generally. With the accustomed order and quiet restored, it may not be out of place to remark now upon certain phases that have characterized this perturbation in our midst; to examine also a little into the nature of its ostensible causes and consider the classes who appear to have been most active in promoting it. The crisis being over, the Press may now comment upon the various aspects of this business with more freedom than would have been expedient while the public mind was inflamed by the exigencies of the occasion.

In the first place, it may be observed, the cause of the trouble here was somewhat different in its nature from that which led to the turbulent proceedings in the East. There it was more a question of wages; here, of work. There the disturbance grew out of a demand for better pay; here, for more employment. The laboring classes of San Francisco, to which place this movement was mostly confined, have not complained so much of their compensation as of the growing want of something to do; a want that for several months past has, not only here, but throughout nearly all parts of the Pacific coast, been very severely felt.

As is well known, property-holders, more especially the holders of large tracts of agricultural lands, have, through the flattering and very often exaggerated accounts published about California, drawn hither a considerable emigration from the Eastern States and Europe, and which, added to the natural increase of the country, has, during the last few years, added largely to our permanent white population.

California is a land prolific in children, and our youth mature early, reaching betimes a growth that fits them for physical labor. From these two sources the various industries of the country were receiving a sufficient supply to meet all healthful and normal demands for labor, and well would it have been for us had they been left to draw upon these sources alone.

Such, however, has not been the case. While we were growing or importing enough white, Christianized labor to serve every purpose, China has been suffered to pour in her debased and servile hordes upon us, forcing down wages while they created a sharp competition for the work that was to be done. In this fight for employment, these coolies, owing to their habits and modes of living, have been able to nearly monopolize certain pursuits and callings, and even engross many important industries altogether, thereby entailing a great hardship upon our own working classes, more especially the youthful and female population. All branches of manual labor which, requiring but little skill or physical strength for their performance are, in other countries, reserved for boys, girls, women and children, have here been monopolized almost wholly by the Chinese, exciting against them the deep and determined hostility of our entire working population.

And this is the problem with which we have to deal. How we shall be able to retain here, this odious race and find work for our own unskilled laborers while we prevent fatal collisions between these two classes at the same time, is the question which our legislators, economists and the molders of public sentiment in general are called upon to solve. There is no use of denying or attempting to disguise the facts as above stated. The condition of things as here represented, actually exists and is daily growing worse. That our mechanics, craftsmen and the mass of day laborers should have held aloof from participating in the late riots and even aided the regularly constituted authorities and those who were co-operating with them in their efforts for preservation of life and property, argues nothing against their fixed hostility to the Chinese and their determination to prevent by all lawful means, the further ingress of that people upon these shores. Whether, if this immigration is suffered to go on unrestrained, the efforts of these classes to check it shall be confined to strictly lawful means, is, indeed, open to serious question.

For the present, the danger that threatened our city is over; but the causes that lead to that danger have not been removed, nor perhaps to any great extent abated. The work of eradicating these causes, if that is practicable, remains to be done; and it is time that all parties interested in the issue should set about devising ways and means for its accomplishment. One way for reaching this end might be the more general employment of our own people in preference to the Chinese, while measures are taken for preventing their further emigration to this country. If the protection of person and property, without any regard to bringing about an improved condition of our own industrial classes, is the sole object to be attained, then this might be reached through the employment of overwhelming police force backed by a regular standing army, after the method adopted in the older countries of Europe. This, however, is not a curative, but merely a palliative method; through it the dangerous and dissatisfied classes are not exterminated, only kept at bay.

We should aim at achieving some cure less costly and more beneficent.

Let it be remarked here that we are not interceding for that class of malcontents who neither want work themselves nor care anything about those who do. We have that class amongst us in considerable numbers, larger perhaps than in most other communities. If any means can be invented for getting rid of them we shall not interpose to defeat their speedy and effectual employment. Let them be killed off, if this is the only way by which we can effect their extermination. The thing we are writing about is altogether another matter.

This has been a bad year for the farmers and the employing miners, wherefore there has been but little work to be had among them. The country is full of idle men—idle because they can find nothing to do, while in San Francisco it is even worse. Building, which in the early part of the season was quite active, has nearly ceased, throwing great numbers out of employment. The city swarms with men, women and youth out of employment and out of money. Meantime 20,000 Chinamen do the work that these people wish to perform and which they feel that they have a right to do. Idle men, especially when they feel that they have been wronged, are apt to grow ugly. There is a danger that it will be so here, and that if they do not get other employment the devil will, as the good Doctor Watts tells us is his wont, find something still for these idle hands to do. Let the rich and well-to-do consider if they are not taking some chances of a dangerous outgrowth of proletarian and communistic ideas in neglecting to correct this evil. Cannot something be done to discourage the employment of the Chinese and thereby secure to our needy and deserving white population a larger share of the work that in both the city and county requires to be done? We believe that some concerted action looking to this end is called for, and have faith that if undertaken it would result in great good.

## Quicksilver.

The quicksilver market has been a little excited by a pretty sudden rise in price. It is now quoted at 57½ cents, and has been selling from 42½ up to 50 cents lately. Prices are, however, by no means steady and it is really selling anywhere between 50 and 60 cents, some holding to the latter figure and others offering the former. Only 18 flasks went off on the China steamer, because the Chinamen would not buy at the advanced rates. One of our largest mines closed down a week or so since to reduce the production, which may have had something to do with this rise, but the small shipment to China will leave more than the usual quantity here, so that the closing down of the mines referred to may be counteracted, temporarily at least.

Neither receipts nor exports have been as large during July as in June. The exports for July amounted to 3,719 flasks, valued at \$123,009. The total exports by sea for the first seven months of the year have been 32,292 flasks, valued at \$1,083,520. The total receipts in the city since January 1st, has been 42,948 flasks.

There is little reason for believing that the advance will be maintained. It would be difficult for the large mines to effect any combination to keep up prices, if they were so inclined, as there would be so many competitors if the price were a little higher. There are hundreds of small mines which could produce a few flasks each, every week, if the prices offered sufficient inducement for them to go to work. The miners, however, do not find any profit in working at present prices on the smaller mines.

If, however, the price went up to any reasonable figures, many of these mines would be started up, and were any combination effected among the large mines the price would be cut under so much and by so many that it could not be maintained. The ruling rates are good for gold and silver miners, but poor enough for the producers of quicksilver.

## Lead.

The persistent decline in the lead market has had a disastrous effect on many mines on this coast. In Utah, particularly, the depression has been injurious. In several camps the mines have been compelled to discharge their workmen who have had to go to work prospecting or anything they could find to do. The low prices in lead have prevailed so long that the miners seem to think the market is fried and the price at its normal condition.

This coast produces such large quantities of this most useful and widely used metal, and so many mines have been opened within the past few years, that an immensely increased production naturally resulted. Where there is so much competition, the price of course, dropped, but it was hoped that it was only temporary; now, however, that this has lasted so long, the owners of mines producing lead have been greatly discouraged.

Our treasure shipments to New York in July amounted to \$4,493,079, of which \$3,666,300 was in gold coin. This, together with the foreign shipments, makes a total treasure export for the month of \$7,170,000.



## Sulphur Supply for the Pacific Coast.

## The Nevada Deposits.

Some three years ago there were found in Humboldt county, Nevada, what, at the time, were supposed to be rich deposits of sulphur. The locators of this find came to San Francisco and here endeavored to raise money to aid them in opening up these beds, erecting refining works and introducing this crude and prepared material upon this market. At that time the consumers of and dealers in this commodity were deriving their supplies from Italy, and in part also from Japan, the latter, then, a new source of production, and, distrusting either the quality or sufficiency of these Nevada deposits, extended to the owners little encouragement in their efforts to outfit their property and render the mineral commercially available. This was clearly a mistake on the part of the sulphur buyers, who, had they pursued a more liberal policy, would to-day, without doubt, have been getting the article from domestic sources and at lower prices than they are now paying for it, besides having their wants met with greater certainty and steadiness.

## The Japan Sulphur Banks.

Upon which much dependence was at that time had, have not yielded according to expectation. For some reason or other, most likely because the magnitude of the deposits were at first overrated, or, perhaps, because the government to whom they belonged would not allow them to be largely worked, shipments from that quarter have been limited to a few small cargoes, arriving here at such long and uncertain intervals as precluded buyers from depending upon them; and in estimating the competitive sources of supply for this market, Japan may now be counted out of the field. The sulphur beds of that country are situated on the island of Yesso, 35 miles from the seaport town of Hakodadi, the nearest point from which export shipments can be made, and to which the crude sulphur is carried by the natives in small boats. Hakodadi being some seven or eight hundred miles from Yokohama, is a long way off the route usually pursued by ships trading between Japan and this country. Only two classes of vessels bound hither, are apt to seek that port in quest of cargo, the first being such as having visited the Russian settlements on the Amoor river, returning, may touch here without going much out of their way; and the other ships that, having discharged freight at Yokohama, may sometimes, for the sake of obtaining back lading in part, run down to Hakodadi and take in such small lots of sulphur as may there have accumulated. This business being so unstable and altogether such a petty sort of traffic, the acid factories of San Francisco, the only ones of any magnitude on the coast, cannot rely upon it to furnish them with the raw material.

## The Discovery of Other Sulphur-Bearing Localities on this Coast.

Have from time to time been announced, but none of them have as yet proved to be of much practical value. Where the mineral itself has been tolerably pure and abundant, as has happened to be the case in some instances, the site of the discovery has proved to be too remote from San Francisco, or too far distant from railroad or water communication, to warrant the cost of its carriage to market. Two years ago much was said about the sulphur-producing strata laid open at Steamboat springs, the site of the wonderful chemical activity in Washoe county, State of Nevada. But the mineral here, although spread over a large area, was, on further examination, found to be too much mixed up with foreign matter to admit of its profitable extraction. About the same time another discovery of this kind was reported in Humboldt county; but as nothing further has been heard of it since, it is fair to conclude that it did not amount to much. A portion of the grounds of the Sulphur Bank quicksilver company, at Clear Lake, California, is heavily impregnated with this mineral. Owing to the presence so large a percentage of base substances the out-turn of mineral here, even if the deposit be worked to the best advantage, cannot be large. These include all the localities in our own territory at which sulphur in any considerable quantity has been found. There is said to exist a sulphur bed of some extent in Lower California, but we are not advised as to the probable amount or purity of the article in its natural state, nor yet as to the facilities that exist for refining on the spot, or for shipping the crude material to market. The probabilities are that there is a deficiency in some or all of these respects, or this deposit would before this time have been turned to some practical account. Presumably, then,

## The Only Really Valuable Deposit of this Mineral in the United States.

And, so far as we know, on the western continent, is this in Humboldt county, Nevada; and it certainly reflects unfavorably upon the enterprise and business sagacity of the acid manufacturers and druggists of San Francisco, that this one of our home resources should have been so signally neglected. To put up refineries and otherwise properly outfit an enterprise of this kind, requires but a comparatively small amount of capital; and yet, the owners of this valuable property have been suffered to struggle along, making such improvements as could be effected with their own limited and inadequate means,

many thousands of dollars in the meantime having been sent out of the country for the purchase of a commodity that, with a very small outlay, might have been produced at home, and the manufacture of which would have given employment to a good many working men, furnish transportation for our railroad and other carriers, and incidentally afford aid to various other industries. Notwithstanding they have been so slighted in a quarter where they had reason to expect substantial aid.

## Extent of Deposits—Work Done and Production Made.

The proprietors of these sulphur banks have succeeded in getting them in a tolerable condition for a moderate production. Such developments have been made as prove the mineral to be of extremely high grade and practically inexhaustible. Experts and scientists who have visited the locality give it as their opinion that their is sulphur enough here to supply the world's commerce for an indefinite period; enough within easy reach to meet the wants of our own country for many years to come.

There are two incorporated companies operating at this place, who together own about all the valuable sulphur yielding land in the vicinity, their joint claims covering an area of some four hundred acres. The mineral occurs here in immense strata imbedded in the earth, some of which crop out in great reefs above the surface. For a mile or more in linear extent these deposits exist in great magnitude. How far they reach downward has not been determined, the mass showing no sign of contraction at the considerable depth to which it has been explored. At one point an excavation has been made 218 feet in length and 59 feet across, all in workable bank of sulphur. At another spot some distance from this, another of nearly equal extent, has, with similar results, been

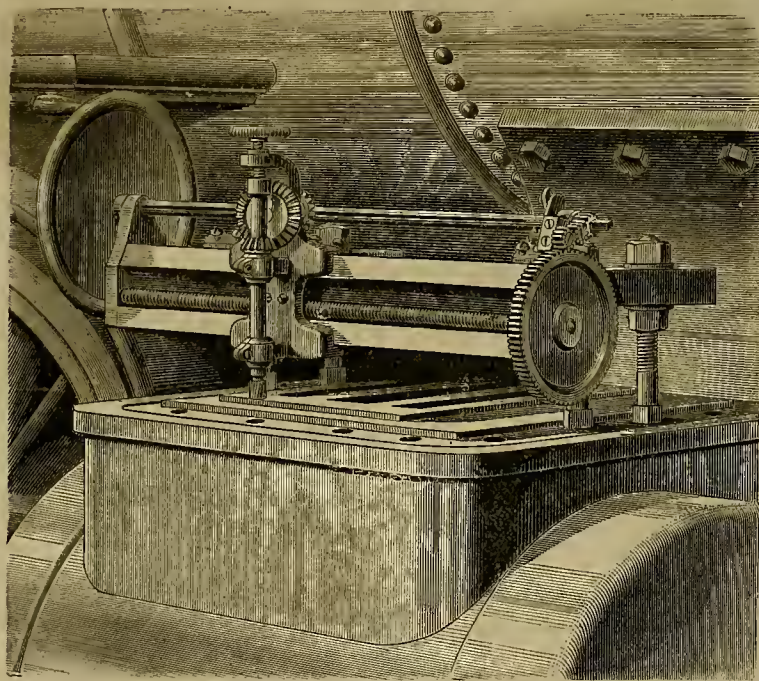
it could be carried on successfully in defiance of competition from abroad, and which would finally result in greatly reducing the cost of this commodity to the consumer.

## Danger of Explosion

In an economic view there are good reasons why consumers, and more especially the manufacturers of powder, should encourage the introduction upon the market of a pure article, like this from Nevada. At a meeting of the San Francisco Microscopical Society, held not long since, Henry G. Hanks, the eminent analytical chemist made a statement to the effect that much of the sulphur here sold as sublimated, consisted merely of the powdered article, and consequently contained a considerable percentage of foreign matter. Mr. Hanks illustrating and confirming his statement by submitting to microscopic inspection samples of what purported to be sublimated sulphur purchased by him from various druggists in the city. On the strength of the same good authority there is reason to believe that many of the otherwise unaccountable explosions that occur in our powder mills are due to the substitution of this deteriorated sulphur for the sublimated article, a consideration that should admonish great caution in the use of materials for the manufacture of this explosive.

## Improved Steam Chest Seat Milling Machine.

Those acquainted with locomotive repairing know that the action of the heat in the steam causes the acid in the lubricating tallow to corrode the iron. This is especially noticeable as occurring in the vicinity of the valves and steam chest. In the latter case, the ledge which sup-



CAMPBELL'S MILLING MACHINERY.

made. Altogether the two companies have extracted something over two thousand tons of the crude material, about two-thirds of which have been refined on the ground and the balance shipped in its native state, the whole having found market in this city. Each of these companies have erected refining works with other needed buildings at their mine, their joint expenditures for these and other necessary improvements having amounted to about \$50,000.

The sulphur containing material taken out here averages about 70 per cent. pure mineral, a great deal of it being chemically pure; of this latter variety many tons have been extracted, the whole of it of sufficient purity for the manufacture of powder without being subjected to any artificial process whatever. Last summer a block of this kind, weighing 1,200 pounds was broken out and started for the Centennial Exposition, where it would, no doubt, have caused some wonderment, had it succeeded in reaching its destination; an end that was defeated through a mishap at the railroad, where it fell while in the act of being hoisted upon a car and broke to pieces. These deposits of sulphur fields is distant about 30 miles in a northerly direction from Humboldt station on the Central Pacific railroad, between which points an excellent wagon road has been constructed.

Now that it has been demonstrated that we have at home enough sulphur to meet all local and national requirements, a couple of things, it seems to us, should at once be done; sufficient capital should be furnished the parties having this business in hand to enable them to enlarge and prosecute it with efficiency, a preference being given by purchasers and consumers to this over the foreign article; then Congress should impose a small duty on the importation of crude sulphur, just enough to enable our own producers to get and keep the home market, a policy that would soon so develop this industry that

ports the steam chest is frequently corroded to such an extent as to require repair. To do this necessitates much time and labor, as a recess or groove has to be cut with the chisel; and then brass strips are driven in and trued up to effect a tight joint.

The object of the invention illustrated in the annexed engraving is to accomplish this work of grooving, then of truing off the inserted pieces, without skilled labor and in a short time. The machine is supported by four studs, as shown; and motion is imparted to the mill or cutter by a shaft on which slides a suitable gear, meshing into one on the tool carrier or crosshead, the latter being fed to the work, in either direction, by a screw and suitable gearing, shown on the end of the machine. The tool, in starting, is fed down by the small hand-wheel on top of the carrier. Motion is given by turning the crank; and when it is desired to feed in an opposite direction, the small gears are disengaged by moving the small lever and swivel to which they are attached. The machine is also used to cut out the ports on new work; and by replacing the cutter with a drill, holes can be bored for the studs.

This invention has, we are informed, been successfully used in the shops of the Pennsylvania railroad at Altoona, and is there considered a very useful tool, saving both time and money. For further particulars and rights to manufacture, address the inventor and patentee, A. H. Campbell, Box 1136, Altoona, Blair county, Pa.

THE work upon the new hoisting works of the New England is almost completed, and in a day or two steam will be turned on. Sinking the incline has been resumed, the tank for the nine-inch pipes being completed.

## Oregon Silver Mud Again.

During the Oregon thermal spring mud excitement of last winter, a gentleman of this city had samples of this mud sent to him to have tested by assay. The returns were so fabulously rich he forwarded to Prof. Silliman, of New Haven, Conn., duplicate samples. He, as well as Prof. Price, of this city, pronounced the mud a "job" well salted and bunglingly "put up." We published Prof. Silliman's opinion in the MINING AND SCIENTIFIC PRESS at that time, and the springs ceased flowing.

They have, it seems, become active again. Muddy silver is said to be all the rage in Oregon, and machinery, bargained for to extract their precious (?) contents, on the ground. Mr. Wm. Currier, a well known merchant of Portland, Oregon, but residing in this city, being anxious to ascertain the facts as to the value of the find, sent, at his own expense, a competent and confidential agent to the springs to examine and report. The samples of the material taken by himself were from springs said to be rich. They were put in bottles, sealed up and forwarded to San Francisco for assay. The gentleman to whom we refer forwarded it to Prof. Silliman for a careful analysis, and he answers as follows:

"The sample of mud sent me I have examined carefully, both by nitric acid and by ammonia, and it contains no metallic silver or chloride of silver. I have also concentrated it by washing and detected nothing in the concentration by the microscope. I have made no fire assay, deeming such a proceeding quite useless after this other evidence so decidedly negative. It is evidently unlike the other samples sent me, in which it was so easy to detect the silver both chemically and optically. I regret that the fraud should come up again under the sanction of Mr. Hanks, whose name carries a certain authority. Can we doubt that he has been deceived? That silver salts have, in past times, come up from the deep-seated laboratories of nature in solution and been precipitated by various agents in veins of silver ore no one can doubt who has made a study of silver mines, but I doubt if ever in the world's history silver salts came to surface in open air or were influenced in any degree by meteoric conditions such as seem to influence the judgment of Mr. Hurley, as stated in his letter of April 19th, cited in the PRESS. I too have examined and now hold in my hand samples of the remarkable mode of occurrence of silver in southwest Utah, near Leeds. I find no analogy in the two cases, but as I propose discussing the character of the Utah locality in a separate paper, I will not now go into its merits."

## Legitimate Mining.

The business of mining is now established on a more permanent and safe basis than it ever was before on this coast. The recent depression in mining stock values is more a proof of this than otherwise. Mines in which nothing of value can be seen, do not sell now-a-days for a high price. People are wiser in this respect than they were, and if they think a company is running a mine more for stock speculating than for legitimate work, they are suspicious of reports from it. This year, particularly, capitalists who have drawn out of stock speculations have commenced to invest in legitimate mining enterprises over which they can exercise control. It will be found more profitable in the end to get hold of a good mine and work it economically in a small way than to be one of a large company, with numerous employees and officers and heavy expenses, but not always correspondingly profitable. This is one of the reasons why there has been a revival of the quartz interests of California this year. There are numerous mines in this State which are being worked quietly and economically by private individuals, which are paying well. The general public hear but little of them, as their names do not appear on the stock lists, and the results of the operations are known only to the owners. There are many mines of like character already discovered, and partly developed, which require only a moderate investment of capital to be put on a paying basis. The miners or prospectors who own them have not the means to put up machinery for hoisting and pumping, which all mines need after a certain depth has been attained, and they lie idle in consequence. Those who desire to engage in this legitimate kind of work, can find mines enough, and if judicious care is exercised in the selection, there is little danger of loss. There is no necessity of putting up an expensive mill because one owns a mine. There are generally custom mills enough to work the ore until the mine can pay for its own reduction works. We know of no more satisfactory investment than a good mine, under the owners' management, worked carefully and economically.

THE telegraph brings news of a grave disaster to the Russians before Plevna, there being great loss of life in the ranks of the Czar. Eight thousand are reported killed and 24,000 wounded. The Turkish force to the number of 20,000 was entrenched, and they repulsed the Russians with great slaughter.



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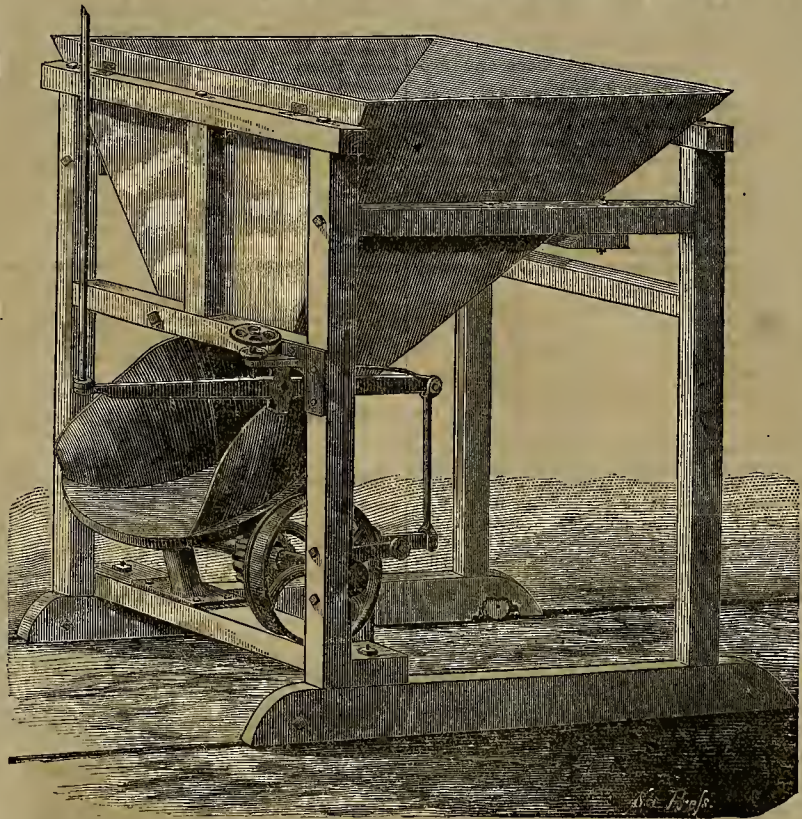
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 that it would not be sufficient to file a claim after that  
 time, even if done before the payment of the second divid-  
 end. Therefore, claimants must take prompt action in  
 order to protect their interests, because in some instances  
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 that claimants should place their policies only in the  
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 Francisco and elsewhere have placed the claims of their  
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Parties who have only partially filed their claims by cor-  
 respondence with the late Receiver, Grace, who has been  
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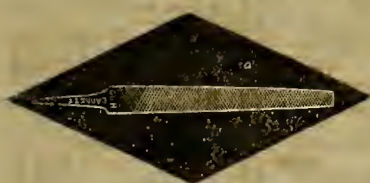
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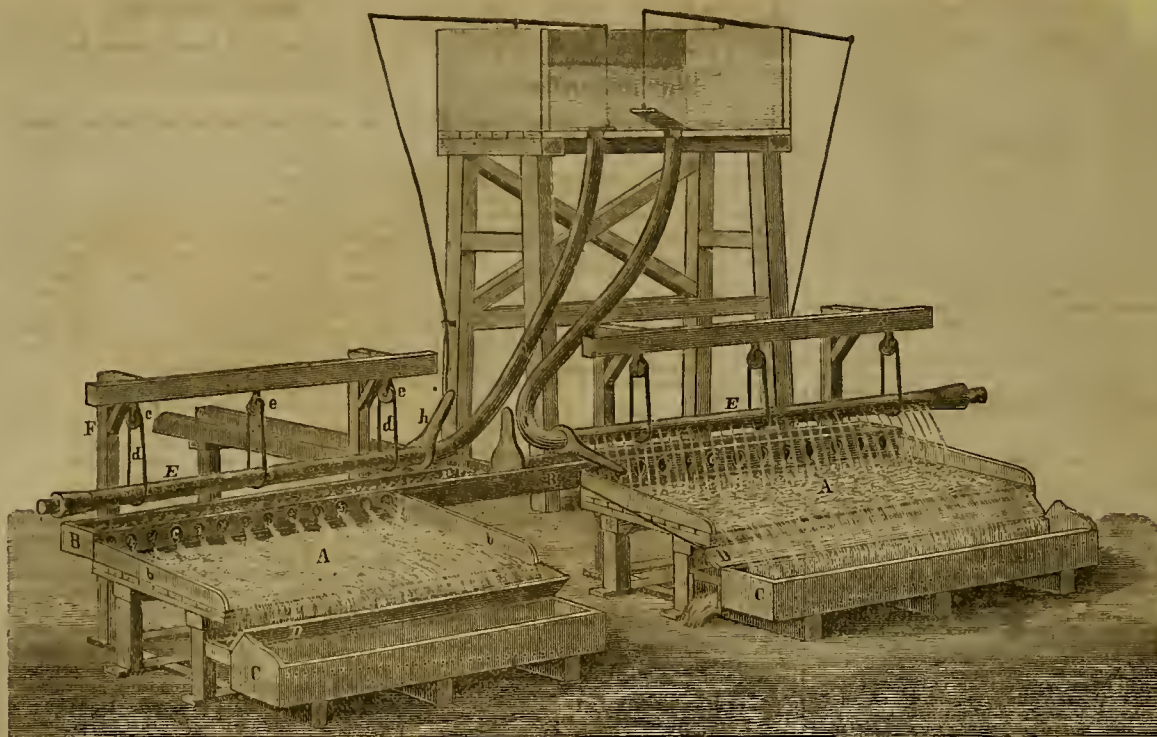
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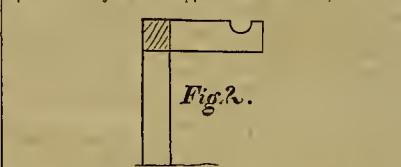
TOLLES IMPROVED CONCENTRATING TABLES.

### Improved Concentrating Tables.

The illustration on this page represents an improvement in concentrating tables for ores recently patented through the MINING AND SCIENTIFIC PRESS Patent Agency, by J. U. Tolles, of Virginia City, Nevada, who has been using the apparatus very successfully in several places. In the engraving, *A* represents a flat inclined table provided with a surfining of cloth or other suitable material of any kind, and with the ledges *b*, to prevent the material from passing over the ends. *B* represents a peculiarly constructed feed box extending along the upper edge of the table and provided in its front side with a row of discharge openings, *c*, of the form shown, each narrowing down to its lower end and of such a size as the nature of the material requires. *C* represents a receiving box or trough, extending along below the lower edge of the table. *D* represents a leaf or board hinged to the rear side of the trough or box *C*, in such a manner that it may be turned under the edge of the table to conduct the valuable material therefrom into the box, the refuse passing over the edge of the table and discharged upon the ground, or into the box in the rear of the box *C*. *E* represents a rotating tube or pipe suspended lengthwise above the upper edge of the table by endless belts *d*, passing over pulleys *e*, supported in the rigid frame *F*, or by brackets fastened to the frame and extending out the proper distance over the table, the tube resting and rotating upon them as shown in Fig. 2. The tube is provided from end to end with a row of perforations, and with a hand lever, *h*, at one end, and is connected by a hose *i*, to a tank, pump or reservoir, delivering water at a pressure of from eight to 12 feet of head, as the nature of the case requires.

In operating the machine the feed box is narrowed to about one inch at its farther end, or has a strip of board set edgewise in the bottom, and running obliquely across the same from the rear to the front side, causing the material to gradually be brought to the front and discharged through the feed holes *c*, upon the table, thereby insuring an even distribution and steady flow of the material to be treated; a steady and copious supply of water is maintained in the box, and the ores, sands or tailings introduced therein. The water escaping through the openings, *e*, flows down in a thin light stream over the face of the table. The mineral particles are deposited upon and retained by cloth or other surfacing material on the face or bed of the table, while the light refuse matter is carried over the lower edge and discharged outside of the box *C*. After the collection of a suitable amount of metal upon the

table, the supply of water, etc., to the feed box is stopped by the gate and turned upon the other table. Clear water is now supplied to the first pipe, *E*, and allowed to run down over the table, (for a moment), washing off the remaining refuse sands, and at the proper time the hinged leaf *D*, is drawn (by the rod) under the edge of the table, the pipe being rotated or turned and the water thrown through the perforations upon the table in a row of fine jets, forming an almost continuous sheet or film. By means of the lever *h*, (which should be fastened on the pipe at right angles to the line of perforations), the tube is turned and the sheet of water swept over the table from the top to the bottom so as to drive all adhering particles therefrom and wash them down into the box *C*. After this operation the jets are stopped from the tube, the leaf

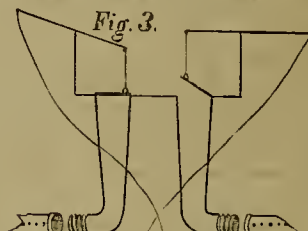


thrown back, and the gate shipped to the other feed box, the feed water coming back on the first table, the operation being repeated as often as it is seen the tables are charged with the sulphurets or other valuable metals.

By employing the proper kind of cloth, grooves, riffls, or copper plating, or all of them combined, and giving the tables the proper grade, and properly regulating the flow of water, the inventor finds that he can effect a very rapid and thorough separation without agitating the table, and without power of any kind except the manual labor requisite to change the feed from one table to another, and washing them off by means of the water used in the pipes; he also finds by the employment of the fixed table he can separate particles which cannot be retained in machines which vibrate. By use of the feed openings, *e*, of the form shown, the discharge of the sand, ore or other fine material is rendered very steady and gradual, as it will be carried through the narrower portion of the openings, while the lighter water will pass over the same through the upper large end of the openings, taking up the material very gradually and distributing it very evenly upon the table. It is obvious that the rotating tube may be sustained in any other manner, and that it may be connected in any suitable manner with the source of the water

The object in arranging the perforated pipe so that it can rotate is to permit a gradual change in the direction of the jets, so that their point of impact upon the table can be advanced from its upper to its lower edge, and thereby every portion of the surface subjected in turn to the direct impact of the jets, in order to effectually loosen and drive forward the particles therefrom.

The flow of water can be regulated by the valves operated by the cords. The gate shown in the feed trough, *G*, will throw the water into either feed trough as desired.



The plugs in the ends of the pipes, *E*, are for the purpose of freeing them of any obstructions.

Fig. 3 represents the most convenient form of erecting the tank or reservoir which supplies the tubes with water; it usually being placed directly overhead with water shed underneath.

Mr. Tolles with this apparatus does not profess to do what many others claim to do, but he is running many of them where everything else has failed. He has been running several of these tables on the Comstock for nearly two years and is now building more. By using the proper kind of sizing apparatus in connection with the tables, the inventor is doing some close work with them at a nominal expense of constructing, running and keeping in order. He states that any person using anything of like nature, or any portion of the same for like purposes, without first obtaining license for so doing, will be prosecuted for damages for such use. Persons at a distance can build and run them by first obtaining license and instructions from the inventor, John U. Tolles, at Eureka, Humboldt county, California, or W. S. Tolles, his authorized agent at Virginia, Nevada.

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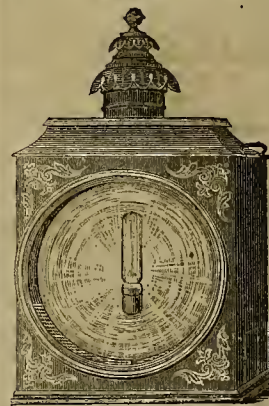
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Continued from Page 69

The gravel in the bottom of the shaft prospects in gold; one piece found weighed \$133, and is in the shape of a Roman cross. Flanagan, Dodson & Co. have also commenced sinking a shaft on Weaver gulch, intending to go to bedrock if possible. Bill Johnson's arastras are running on ore from the Antelope and Marcus mines, and is paying well. George Bird and John Timmerman are astraining from the Mulum in Parvo mine, which pays \$30 per ton. Mr. Partridge is having his shaft, on Sexton, pushed ahead vigorously.

**DRY WASHING.**—A great local excitement is raging here over "dry washing machines." Mr. J. Powell arrived here about two weeks ago with one of those machines, and has since then been making a grand success, saving the finest flour gold. Mr. Powell states that he can run through 52 tons a day with the assistance of three men, and clear \$100 per day from ground that will prospect three cents to the pan. Mr. Powell is about to have several more of these machines constructed. A great many companies are being formed to go into the dry washing machine business. It is claimed that from Rich bill to the Hassayampa, a distance of 10 miles, the whole plain, gulches, arroyos, canyons, bars and hills will pay five cents to the pan. Up to the present time water has been the great desideratum in the district. The placer ground being located so rapidly in 20-acre tracts, the miners of the district held a meeting and cut down placer claims to 200 feet square, thus giving everybody a show. Mr. McBain, who at present is building Mr. Partridge's new hotel on Antelope creek, is about to take a contract to make a large number of those dry washing machines. He has one of his own in company with some others at Prescott, which he intends to have removed to this place at once. When the work is done, the machines are at work here and they accomplish half what is claimed for them it will make things lively.

### Idaho.

**EMPIRE.**—Owyhee *Avalanche*, July 21: Work progresses satisfactorily in the fourth and fifth levels of the Empire and the mine is looking well in all directions. The rich ore shut from which much good rock has been extracted during the past few months will, it is believed, extend to the surface.

At the Oolden Chariot sinking operations are progressing under the most favorable auspices.

**THE BELLE PECK** is in the full tide of successful operations again. There are nearly 70 tons of rich ore on the dump awaiting crushing and it will undoubtedly yield from \$70 to \$80 to the ton. Within a day or two there has been encountered in the lower level of this mine a richer vein than was ever worked since the mine was opened.

**THE POTOMI** is looking better than ever. Sinking operations are still going on and at a distance of about 20 feet from the present point of work the way will be paved for opening up the rich ore body of this mine. Several hundred tons of good rock will be taken out this summer.

**ILLINOIS CENTRAL.**—We understand that arrangements are being made among the leading creditors of the Illinois Central to buy this mine, and that mine on a large scale and under favorable auspices.

A vein of unusually rich rock has been encountered recently by John Ward, who has the best of reasons for believing that he has got a bonanza at last. He struck it about 100 feet from the Silver Cord in the direction of the Elwell mine.

**ILLWILM.**—A quantity of rock, nearly six tons in all, taken from the Illwilm mine, and crushed at the Leonard mill recently. It yielded about \$35 to the ton and shows that this mine is all that we have cracked it up to be.

**M. A. BALDWIN, Esq.**, late Supt. of the Oolden Chariot mine, returned on Monday from a trip to Atlanta and Rocky Bar. He speaks in glowing terms of the magnificent mineral resources of that section of our rich Territory, and expresses the belief that Alturas county will at some future day be among the leading mining districts of the world. The mines now being worked by the Monarch and Buffalo companies embody immense treasure deposits and ought to be furnishing employment for many hundred men. Each mine has a reserve of good milling ore that will last for years to come, even if no further development be made. At present work is being carried on with a view to the extraction of ore for shipping purposes only.

### Montana.

**COPPER—Butte Miner**, July 24: Mr. A. M. Esler last week shipped to Corinne from the different copper mines of this place under his management, between 70 and 80 tons of copper ore. The entire shipments of the season Mr. Esler estimates at 800 tons, on which the freight at \$25 per ton will amount to \$20,000, to say nothing of the railway charge for transportation to Baltimore, its final destination. As there is nothing in the nature of a mystery or secret in the smelting of copper ores, it is evident that a smelter will be erected in Butte just as soon as the developments made on the copper lodes will be sufficient to prove their permanency.

The *astras*, a mile below Silver Bow, that Messrs. Gassett & Weeks have been busy for the last four months in building, will be completed and ready to commence work this week. This *astras* is almost as much of an addition to our working facilities as another mill would be, as it is confidently expected to work four tons of ore per day. It is driven by a 24 foot overshot wheel and has two *astras* beds each 12 feet in diameter, and is well provided with all the appliances necessary for amalgamating silver ores. It is the intention of its owners to employ it chiefly on custom work.

In the La Plata mine but four men are now employed on each shift, as there is no work going on further than the running of prospect drifts. A good deal of trouble is given by the water which increases in amount as the lateral drifts are extended. The shaft is down to the depth of 210 feet, not perpendicular, but on a slight incline, and no further sinking will be attempted without steam. The water is taken up in a metallic water valve that holds over fifty gallons and is hoisted by a whim worked by one horse.

### Utah.

**SANDY.**—Cor. Salt Lake *Tribune*, July 20: The Mingo has its new roaster, and making preparations for the erection of new boiler and engine that will be of sufficient force to run the increase of stacks it is intended to erect within a short time. The Fligstaff, under the management of A. W. Geist, will show a good yield for this month, as it jugs along with its four stacks regularly.

**BIGHAM.**—Ed. Eagan & Co. are erecting a 10-stamp mill, to be run by an engine, on main Bingham, for the purpose of concentrating ore. Above Eagan & Co. is the water mill of Silas McGuire, who has just taken to the city 60 tons of concentrated ore. Further on, and at the entrance of Bear gulch, jiggers are at work on Nez Perce ore. Up main Bingham to Highland, the next change we note is at the Spanish mine, where they are now placing in position an engine and boiler, doing away with the old water wheel. Next on the list is the new Jackson mill, of 10 stamps, now being completed, and will be ready for work next Monday. New shafts and dumps are built. On the side of the mountain, above Highland, is the Orphan Boy. The mine has a fine body of ore in sight. The Oray Eagle, on the opposite side, is worked under lease by Toole & Monahan, who have a fine lot of ore in the city for sale. Crossing the range over to Muddy, the first claim we come to is the Hooper. A large amount of work has been done on this claim and large bodies of ore are in sight. The Last Chance is now being worked by Mr. James W. Hamilton, who has leased the same. This will be encouraging news to the company in London, as it will fully demonstrate to them that they have a paying mine. It is rumored, and with some truth, that the company intend at no distant day to put in suitable machinery for the further development of their property. And, when in operation, it will prove one of the best mines in Utah. The Saturn is worked by Bennett & Watson. They are extracting some rich ore, and have considerable on the dump. We hear

of several new mills about to be erected in this vicinity, and certainly there is no better field for the operation of attention of mill men than this camp, as there are large amounts of ore awaiting reduction and concentration.

### New Incorporations.

The following companies have filed certificates of incorporation, in the County Clerk's office, at San Francisco: **STANDARD OIL CO.**—July 27th. Location: California. Capital stock, \$2,500,000. Directors—F. B. Taylor, A. J. Bryant, M. L. McDonald, D. O. Schofield and D. C. Scott. **THE PUNTA ARENA RAILWAY AND LUMBER CO.**—July 25th. Object: To operate a railroad running from Point Arena harbor into the lumber regions of Mendocino county, a distance of twenty miles, and to a general lumber business. Directors—J. W. Tripp, Wm. Booth, Joseph S. Kohn, D. Freeman, and Geo. T. Tolman. Capital, \$2,600,000.

**BUNKER HILL M. CO.**—July 25th. Location: California. Capital stock, \$10,000,000. Directors—R. E. Brewster, Edmund Green, M. A. Kerr, Daniel Doherty, F. McIntyre. **CALIFORNIA AND ARIZONA MINING AND REAL ESTATE CO.**—July 25th. Object: To deal in mines and real estate in Arizona and New Mexico. Directors—J. B. McKee, Henry R. Ewalt, Levi Bashford, E. P. Head, John C. Hayes. Capital, \$200,000.

**VENTURA M. CO.**—August 1st. Location: Elko Co., Nev. Capital stock, \$10,000. Directors—Robert Sherwood, John McNally, W. C. Hendrie, W. F. Bean and W. E. Reed. **NEVADA CO. M. CO.**—August 1st. Location: Capital stock, \$10,000. Directors—F. A. Wilder, A. W. Sisson, D. Libby, Ira O. Holt and Joseph Pontecost.

**GOLDEN FLEECE GRAVEL M. CO.**—August 1st. Location: California. Directors—John Leddy, W. A. McDougal, A. Wason, John Oliver, F. Schirmler. Capital stock, \$33,000.

**SILVER KING NORTH M. CO.**—July 20th. Location: Arizona. Capital stock, \$10,000,000. Directors—Jas. Walsh, W. E. Hale, Leon Well and Camilo Martin. **SANTA RITA M. & S. CO.**—July 20th. Location: Inyo county. Capital stock, \$3,000,000. Directors—J. M. Tinoco, Jose Carrascosa, Jose Schleiden, Thomas Breen and J. B. Arrambide.

**INCA M. CO.**—July 21st. Location: Aztec district, Arizona. Capital stock, \$10,000,000. Directors—W. O. Graham, A. K. P. Safford, C. A. Page, John Haynes and S. B. Benedict.

**BESSER M. CO.**—July 23d. Location: Idaho. Capital stock, \$75,000. Directors—M. Eisler, Oustave Lang, Chas. E. Morgan, Andrew Baird and H. B. Williams.

### Argentiferous Hematite.

**EDITORS PRESS.**—In reading an old number of the PRESS, I saw an article from the pen of Prof. Hanks describing a variety of argentiferous hematite. As Prof. Hanks has decided, this is not a new mineral. It is found in several localities in Arizona and New Mexico, but I have never heard of its being found elsewhere.

Large deposits of this substance have been found in Globe mining district, where it is much prized as a flux in smelting copper. Singularly enough, it is often found in veins that are rich in carbonate of copper. The mineral is generally quite pulverulent, is nearly always micaceous, and when rubbed upon the palm of the hand has the appearance of graphite, for which it is frequently mistaken.

The silver which it contains is accidental and varies in amount. Frequently it contains none, but occasionally it gives a very high result, not only in silver but also in gold.

The silver is, I believe, always combined with either chlorine, bromine, or iodine. A fragment of a very rich specimen, which came from near Prescott, gave the following approximate analysis:

Oxide of iron.....	89.3
Oxide of manganese.....	3.4
Iodide of silver.....	7.1
Total.....	99.8

In this specimen there was no doubt about the presence of the iodine, or of its being in combination with the silver—a matter concerning which Prof. Hanks was somewhat in doubt. Other specimens which I have had have given a reaction for chloride of silver.

There was a prevailing impression at one time among the miners of Globe district that this substance was a "red oxide of silver."

J. W. REDWAY.

Los Angeles, July 25th, 1877.

### Borax.

The borax trade, which was at one time not long since a very prosperous and apparently increasing one, has declined in extent so that most of the Nevada refineries are idle. The deposits of borax in Churchill and Esmeralda counties in that State are remarkably productive and practically inexhaustible. The importations of borax, which escapes the duty on manufactured articles, prevent the working of these deposits to a profit, so that the mines have been compelled to shut down entirely.

There is one large English house which completely controls this article of commerce, as other houses control quicksilver in Europe, and here manganese, asbestos, chrome ores, etc. This house has it in its power to put the price down so low that it will not pay to produce here, and when they found that competition was likely to affect their interests here, they reduced the price lower and lower, until our miners were compelled to give in. At the same time they have their eyes on the Pacific coast deposits, and it was only a few months since that one of their emissaries was here examining the mines. If they get the control they desire, it is probable that some of the mines will again be worked, but not unless in their interests.

The public debt statement shows a reduction during July of \$818,904. Coin in the Treasury, \$97,803,950; coin certificates, \$37,807,300; currency in the Treasury, \$9,811,956.

### General News Items.

A DELEGATION of Sioux Indians will visit Washington for the purpose of holding an interview with the officials of the Interior Department.

ADVICES from Ecuador state that the damage done by the late eruption of Cotopaxi, amounts to over \$1,000,000. Many lives were lost, and over 1,500 head of cattle destroyed.

The police force in this city has been doubled, the hanks advancing the money to pay the men and the city, through the Supervisors, has pledged its credit for repayment of the advance.

THE American flag has been hoisted at Samoa; and unless the action of the consul is repudiated by the authorities at Washington, the islands of the Navigators group will henceforward have to be accounted as in the possession of the American Government.

THE famous Newberry will case, of Chicago, has been decided in favor of the heirs. Should the State Supreme Court confirm this decision, North Chicago will come into immediate possession of two to three million dollars, to be used in founding a public library.

THE Marquis of Salishury, Secretary of State for India, gives a very gloomy view of the famine. The prospects in India have, during the last few weeks, become more gloomy. Advances from Bombay state that refreshing rains have fallen; and rice has declined two rupees and supplies are increasing.

THE committee appointed to examine into the condition of the Charter Oak Life Insurance Company, report that under a proper economical management the company can be made to pay its legal liabilities in full. On the report of the committee a plan for the reorganization of the company was effected. The old officers resigned and a new board was chosen.

### Mines and Surveys.

Connected with the War Department is a corps of surveying engineers, the chief of which, Lieutenant G. W. Wheeler, recently visited this city. The result of the surveys is really for the use of the War Department—to put into the hands of our officers charts explaining the best facilities for transportation of troops and supplies, the necessity for such accurate information having been severely felt in some cases during the civil war; but in the course of the prosecution of this work other matters of as great importance to the community, particularly the mineral yield of the country, are looked into. All the information obtained goes to the War Office, and the operations of this force are under the control of the Secretary of War. This engineering corps takes the place of the old Topographical Bureau which existed up to the year 1862. It is carrying on, so far as possible, the work commenced by that bureau, and in thus trying to secure a better geographical knowledge of the country the Government is following the worthy examples set by European nations 70 and 100 years ago. Knowledge is strength, and so the Prussians found it in the late Franco-German war; for to a superior topographical knowledge of the country is very largely attributed their success, and it is of paramount importance that we should be well informed respecting our own country. The corps of engineers is only small, and works slowly, sometimes being delayed for want of funds. At present it is close by our side, and may develop something of interest. The party is divided into three sections, one having its headquarters at Fort Lyon, on the Arkansas; a second in Utah, operating from Ogden; the third in this State. This last party is divided into four sections, one having specially been appointed to survey the district of Virginia City, Carson City and Reno, in which there is a difference of altitude ranging from 4,200 to 11,000 feet, giving an idea of variation in altitudes, of which so little is at present known. But another special party of this surveying company will attract more attention than the former, and their doings and reports be watched for very eagerly by a portion of the community, for in the discharge of its duties it is likely to examine the Comstock lode and Sutro tunnel, and what may be the outgrowth of their report it would be foolish to endeavor to predict.

WOODWARD'S GARDENS has the following new attractions: The buffalo chase; large whale skeleton; new museum; improvements in the zoological department, besides the other features which have made it popular.

### Signal Service Meteorological Report.

Week Ending July 24, 1877.

HIGHEST AND LOWEST BAROMETER.						
July 25	July 26	July 27	July 28	July 29	July 30	July 31
29.86	29.86	29.92	30.00	29.97	29.87	29.93
29.82	29.83	29.86	29.95	29.83	29.77	29.82

MINIMUM AND MAXIMUM THERMOMETER.						
05	64	65	64	63	69	64
65	64	64	65	65	64	64

MEAN DAILY HUMIDITY.						
77	80	80	79	79	71	78

PREVAILING WIND.						
SW	SW	SW	SW	SW	SW	W

WIND-MILES TRAVELED.						
322	298	298	298	296	240	320

STATE OF WEATHER.						
Fair.	Fair.	Fair.	Fair.	Fair.	Clear.	Clear.

RAINFALL IN TWENTY-FOUR HOURS.						
Total rain during the season, from July 1, 1877, 0.02 in.						

### METALS.

WHOLESALE.

THURSDAY, M., July 26, 1877.

IRON.—		
American Pig, ton.....	28 00	@ 32 00
Scott Pig, ton.....	27 00	@ 33 00
White Pig, ton.....	28 00	@ —
Refined Pig, ton.....	—	@ —
Refined Pig, ton.....	34 00	@ 64
Horse Shoes, keg.....	5 00	@ —
Nail Rod.....	—	@ —
Nail Rod.....	—	@ —
Norway, Oval.....	—	@ 74
Roller.....	—	@ —
COPPER.—		
Copper Tinned.....	37 00	@ 40
Sheathing B.....	37 00	@ 40
Sheathing Yellow.....	21 00	@ 22 1/2
Sheathing Old Yellow.....	10 00	@ 11
Composition Bolts.....	21 00	@ —
Composition Bolts.....	24 00	@ —
STEEL.—		
English Cast, lb.....	14 00	@ 25
Anderson & Woods, ordinary sizes.....	16 00	@ —
Drill.....	16 00	@ —
Flat Bar.....	15 00	@ 18
Plow Steel.....	84 00	@ 12 1/2
TIN PLATES.—		
10x14 1/2 C Charcoal.....	8 50	@ 9 00
Australian.....	24 00	@ —
19x20.....	19 00	@ 20
ZINC.—		
By the Case.....	11 00	@ —
Zinc Sheet 7x3 ft. 7 to 10, lb.....	11 00	@ —
4x6, 10 to 14.....	12 00	@ —
8x4 ft. 8 to 10.....	12 00	@ —
8x4 ft. 11 to 10.....	12 00	@ —
NAILS.—		
Common sizes.....	3 00	@ 3 25
QUICKSILVER.—		
By the lb.....	47 1/2	@ 50

### GENERAL MERCHANDISE.

[WHOLESALE.]

WEDNESDAY M., August 1, 1877.

BAGS.—		OILS.	
Eng. Standard Wheat, 12 @ 12 1/2	12 1/2	Neatfoot, No. 1, 01	00 @ 90
Hand & Co's		Castor, No. 1.....	06 @ —
Naville Sewed, 22x35, 12 @ 12 1/2	12 1/2	do, No. 2.....	1 05 @ 30
22x36.....	—	do, No. 3.....	1 05 @ 30
23x40.....	—	Oliva, Plain, 50.....	25 @ 25
Machine Sewd, 22x36, 11 @ 12 1/2	12 1/2	Possel.....	4 75 @ 25
Flour Sacks, halves.....	9 @ 11	Palms, lb.....	9 @ —
Quarters.....	5 @ 6	Lined Raw, bbl.....	90 @ —
Eighths.....	4 @ 4 1/2	Boiled.....	85 @ —
Hessian, 50 inch.....	13 00	Cocanut.....	30 @ —
45 inch.....	9 @ —	China nut, cs.....	63 @ 70
40 inch.....	8 @ —	Sperm.....	50 @ 65
Wool Sacks.....	—	Coast Whales.....	50 @ 65
Hand Sewed, 3 1/2 lb. 45 @ 3	45	Polar, refined.....	50 @ —
Machine Sewed.....	45 @ 3	Lard.....	1 10 @ 20
4 lb. 52 @ 3	52	Oleocine.....	35 @ —
Standard Gunnies.....	14 @ 15	Greece's Bril.....	30 @ 30
Bean Bags.....	7 @ 8	Nonpariel.....	50 @ —
CANDLES.—		Eureka.....	22 @ 25
Crystal Wax.....	19 @ 20	Barrel kerosene.....	30 @ 30
Eagle.....	12 @ 13	Downer Ker.....	47 @ 50
Patent Sperm.....	23 @ 30	Elaine.....	50 @ —
CANNED GOODS.—		PAINTS.	
Assorted Pie Fruits.....	—	Pure White Lead.....	9 @ 10
2 1/2 lb cans.....	2 75 @ 30	Whiting.....	12 @ —
Table 12 @ 12 1/2	12 1/2	Putty.....	4 @ —
Jams and Jellies.....	4 @ 25	Chalk.....	14 @ —
Pickles, 1/2 gal.....	3 @ 50	Pure White.....	35 @ —
Sardines, q. box.....	1 65 @ 90	Ochre.....	3 @ —
Hf Boxes.....	—	Venetian Red.....	3 @ —
COAL.—		Averill Mixed	
Australian, ton.....	9 00 @ 9 25	Paint, grey.....	3 00 @ 4
Coos Bay.....	8 00 @ —	Black & tint.....	3 00 @ 4
Bellingham Bay.....	8 00 @ —	Green, Blue &	
Seattle.....	8 00 @ —	Ch Yellow.....	3 00 @ 4
Cumberland.....	14 00 @ 17 00	Light Red.....	3 00 @ 4
Mt Diablo.....	5 75 @ 7 75	Metallic Roof.....	50 @ 60
Lehigh.....	22 00 @ —	H.C.E.	
Liverpool.....	8 50 @ 9 00	China No. 1, lb.....	61 @ —
West Hartley.....	14 00 @ —	Hawaiian.....	42 @ —
Scotch.....	7 50 @ 8 00	SAIT.	
Scranton.....	13 00 @ 16 00	Cal. Bay, ton.....	13 00 @ 14
Vancouver Id.....	10 50 @ 12 00	Common.....	8 00 @ 9
Charcoal, sack.....	75 @ —	Portland.....	20 @ 24
Coke, bulk.....	60 @ —	Liverpool line.....	17 50 @ 18
COFFEE.—		SOAP.	
Costa Rica, lb.....	21 1/2 @ —	Castile, lb.....	10 @ 10
Costa Rica.....	15 @ 20	Common brands.....	4 @ —
Guatemala.....	15 @ 20	Fancy hbl.....	47 @ 50
Java.....	24 @ —	SPICES.	
Malacca.....	19 @ 19 1/2	Cloves, lb.....	45 @ 50
Ground, in cs.....	25 @ —	Cassia.....	22 @ 25
FISH.—		Peppercorn.....	18 @ 20
Sac to Dry Cod.....	5 @ 8	Putnegg.....	15 @ 17
Boneless.....	8 @ 10	Black Pepper.....	15 @ 17
Eastern Cod.....	7 @ 10	Pimento.....	20 @ 25
Salmon, blks.....	8 50 @ 9 50	Mustard, Cal.,	
Hf blks.....	4 50 @ 5 00	in glass.....	1 50 @ —
2 lb cans.....	3 00 @ —	SUGAR, ETC.	
Pkld Cod, blks.....	22 00 @ —	Cal. Cube.....	13 @ —
Hf blks.....	11 00 @ —	Powdered.....	13 @ —
Mackerel, No. 1.....	14 00 @ 15 00	Fine curbed.....	13 @ —
Hf Blks.....	14 00 @ 15 00	Granulated.....	13 @ —
In Kits.....	3 00 @ 3 25	Golden O.....	104 @ 1
Ex Mess.....	3 50 @ 4 00	Hawallan.....	75 @ —
Pkld Herring, blks.....	3 00 @ 3 50	Cal. Syrup.....	26 @ 30
Boston Smkd Hg.....	40 @ 50	Hawallan Molasses	26 @ 30
LIME, ETC.—		TEA.	
Lima, Sta Cruz.....	2 00 @ 2 25	Ysion.....	35 @ 50
Cement, Roscon.....	2 75 @ 3 50	Country pkd Gun	
Portland.....	4 75 @ 6 50	powder & Im-	
Plaster, Golden.....	3 00 @ 3 25	perial.....	50 @ 50
Gate Mills.....	3 00 @ 3 25	Ysion.....	30 @ 30
Land Plaster.....	10 00 @ 12 50	Japan, 1st quality	40 @ 40
NAILS.—		2d quality.....	26 @ —
Assorted sizes, keg 3 25 @ 4 00	3 25 @ 4 00		



## Mining and Other Companies.

Persons interested in incorporated shares will do well to recommend the publication of the official notices of their companies in this paper, as the cheapest appropriate medium for the same.

## Bella Union Quicksilver Mining Company.

Location of principal place of business, San Francisco, California. Location of works, Napa County, California. Notice—There are delinquent upon the following described stock, on account of assessment No. 2, levied on the twenty-eighth day of June, 1877, the several amounts set opposite the names of the respective shareholders, as follows:

Names.	No. Cert.	No. Shares.	Amount.
Donnell, E. J.	36	100	\$10 00
Donnell, E. J.	37	100	10 00
Donnell, E. J.	38	100	10 00
Donnell, E. J.	39	100	10 00
Donnell, E. J.	40	100	10 00
Donnell, E. J.	41	100	10 00
Donnell, E. J.	42	100	10 00
Donnell, E. J.	43	100	10 00
Donnell, E. J.	44	100	10 00
Donnell, E. J.	45	100	10 00
Donnell, E. J.	46	100	10 00
Donnell, E. J.	47	100	10 00
Donnell, E. J.	48	100	10 00
Donnell, E. J.	49	100	10 00
Donnell, E. J.	50	100	10 00
Donnell, E. J.	51	100	10 00
Donnell, E. J.	52	100	10 00
Donnell, E. J.	53	100	10 00
Donnell, E. J.	54	100	10 00
Donnell, E. J.	55	100	10 00
Donnell, E. J.	56	100	10 00
Donnell, E. J.	57	100	10 00
Donnell, E. J.	58	100	10 00
Donnell, E. J.	59	100	10 00
Donnell, E. J.	60	100	10 00
Donnell, E. J.	61	100	10 00
Donnell, E. J.	62	100	10 00
Donnell, E. J.	63	100	10 00
Donnell, E. J.	64	100	10 00
Donnell, E. J.	65	100	10 00
Donnell, E. J.	66	100	10 00
Donnell, E. J.	67	100	10 00
Donnell, E. J.	68	100	10 00
Donnell, E. J.	69	100	10 00
Donnell, E. J.	70	100	10 00
Donnell, E. J.	71	100	10 00
Donnell, E. J.	72	100	10 00
Donnell, E. J.	73	100	10 00
Donnell, E. J.	74	100	10 00
Donnell, E. J.	75	100	10 00
Donnell, E. J.	76	100	10 00
Donnell, E. J.	77	100	10 00
Donnell, E. J.	78	100	10 00
Donnell, E. J.	79	100	10 00
Donnell, E. J.	80	100	10 00
Donnell, E. J.	81	100	10 00
Donnell, E. J.	82	100	10 00
Donnell, E. J.	83	100	10 00
Donnell, E. J.	84	100	10 00
Donnell, E. J.	85	100	10 00
Donnell, E. J.	86	100	10 00
Donnell, E. J.	87	100	10 00
Donnell, E. J.	88	100	10 00
Donnell, E. J.	89	100	10 00
Donnell, E. J.	90	100	10 00
Donnell, E. J.	91	100	10 00
Donnell, E. J.	92	100	10 00
Donnell, E. J.	93	100	10 00
Donnell, E. J.	94	100	10 00
Donnell, E. J.	95	100	10 00
Donnell, E. J.	96	100	10 00
Donnell, E. J.	97	100	10 00
Donnell, E. J.	98	100	10 00
Donnell, E. J.	99	100	10 00
Donnell, E. J.	100	100	10 00
Donnell, E. J.	101	100	10 00
Donnell, E. J.	102	100	10 00
Donnell, E. J.	103	100	10 00
Donnell, E. J.	104	100	10 00
Donnell, E. J.	105	100	10 00
Donnell, E. J.	106	100	10 00
Donnell, E. J.	107	100	10 00
Donnell, E. J.	108	100	10 00
Donnell, E. J.	109	100	10 00
Donnell, E. J.	110	100	10 00
Donnell, E. J.	111	100	10 00
Donnell, E. J.	112	100	10 00
Donnell, E. J.	113	100	10 00
Donnell, E. J.	114	100	10 00
Donnell, E. J.	115	100	10 00
Donnell, E. J.	116	100	10 00
Donnell, E. J.	117	100	10 00
Donnell, E. J.	118	100	10 00
Donnell, E. J.	119	100	10 00
Donnell, E. J.	120	100	10 00
Donnell, E. J.	121	100	10 00
Donnell, E. J.	122	100	10 00
Donnell, E. J.	123	100	10 00
Donnell, E. J.	124	100	10 00
Donnell, E. J.	125	100	10 00
Donnell, E. J.	126	100	10 00
Donnell, E. J.	127	100	10 00
Donnell, E. J.	128	100	10 00
Donnell, E. J.	129	100	10 00
Donnell, E. J.	130	100	10 00
Donnell, E. J.	131	100	10 00
Donnell, E. J.	132	100	10 00
Donnell, E. J.	133	100	10 00
Donnell, E. J.	134	100	10 00
Donnell, E. J.	135	100	10 00
Donnell, E. J.	136	100	10 00
Donnell, E. J.	137	100	10 00
Donnell, E. J.	138	100	10 00
Donnell, E. J.	139	100	10 00
Donnell, E. J.	140	100	10 00
Donnell, E. J.	141	100	10 00
Donnell, E. J.	142	100	10 00
Donnell, E. J.	143	100	10 00
Donnell, E. J.	144	100	10 00
Donnell, E. J.	145	100	10 00
Donnell, E. J.	146	100	10 00
Donnell, E. J.	147	100	10 00
Donnell, E. J.	148	100	10 00
Donnell, E. J.	149	100	10 00
Donnell, E. J.	150	100	10 00
Donnell, E. J.	151	100	10 00
Donnell, E. J.	152	100	10 00
Donnell, E. J.	153	100	10 00
Donnell, E. J.	154	100	10 00
Donnell, E. J.	155	100	10 00
Donnell, E. J.	156	100	10 00
Donnell, E. J.	157	100	10 00
Donnell, E. J.	158	100	10 00
Donnell, E. J.	159	100	10 00
Donnell, E. J.	160	100	10 00
Donnell, E. J.	161	100	10 00
Donnell, E. J.	162	100	10 00
Donnell, E. J.	163	100	10 00
Donnell, E. J.	164	100	10 00
Donnell, E. J.	165	100	10 00
Donnell, E. J.	166	100	10 00
Donnell, E. J.	167	100	10 00
Donnell, E. J.	168	100	10 00
Donnell, E. J.	169	100	10 00
Donnell, E. J.	170	100	10 00
Donnell, E. J.	171	100	10 00
Donnell, E. J.	172	100	10 00
Donnell, E. J.	173	100	10 00
Donnell, E. J.	174	100	10 00

Name.	No. Certificate.	No. Shares.	Amount.
Donnell, E. J.	175	100	10 00
Donnell, E. J.	176	100	10 00
Donnell, E. J.	177	100	10 00
Donnell, E. J.	178	100	10 00
Donnell, E. J.	179	100	10 00
Donnell, E. J.	180	100	10 00
Donnell, E. J.	181	100	10 00
Donnell, E. J.	182	100	10 00
Donnell, E. J.	183	100	10 00
Donnell, E. J.	184	100	10 00
Donnell, E. J.	185	100	10 00
Donnell, E. J.	186	100	10 00
Head, A. E.	17	1000	100 00
Head, A. E.	18	1000	100 00
Head, A. E.	19	1000	100 00
Head, A. E.	20	1000	100 00
Head, A. E.	21	1000	100 00
Head, A. E.	22	1000	100 00
Head, A. E.	23	416	41 60
Head, A. E.	24	328	32 80
McDonald, J. M. Trustee.	151	416	41 60

And in accordance with law, and an order of the Board of Directors, made on the twenty-eighth day of June, 1877, so many shares of each parcel of such stock as may be necessary, will be sold at public auction, at the office of the company, No. 312 Montgomery street, San Francisco, on Saturday, the twenty-fifth day of August, 1877, at the hour of twelve o'clock, to pay said delinquent assessment thereon, together with costs of advertising and expenses of sale.

ABM. HALSEY, Secretary.  
Office—No. 312 Montgomery Street.

## California Fruit Growing Association.

Principal place of business, San Francisco. Location of property, El Dorado county, Cal.

Notice is hereby given, that at a meeting of the Board of Directors, held on the second day of July, 1877, an assessment of \$1.50 per share was levied upon the capital stock of the corporation, payable immediately in U. S. gold coin, to the Secretary, at 331 Sansome Street, S. F.

Any stock upon which this assessment shall remain unpaid on the sixth day of August, 1877, will be delinquent, and advertised for sale at public auction, and unless payment is made before, will be sold on Monday, the twentieth day of August, 1877, to pay the delinquent assessment, together with costs of advertising and expenses of sale.

HORACE JONES, Secy.  
Office, 331 Sansome Street.

## Cherokee Flat Blue Gravel Company.

Location of principal place of business, San Francisco, California. Location of works, Cherokee, Butte County, California.

Notice is hereby given that at a meeting of the Board of Directors, held on the ninth day of July, 1877, an assessment of ten cents per share was levied upon the capital stock of the corporation, payable immediately in U. S. gold coin, to the Secretary, at the office of the company, room 1, No. 402 Montgomery Street, San Francisco, California.

Any stock upon which this assessment shall remain unpaid on the twenty-fifth day of August, 1877, will be delinquent and advertised for sale at public auction, and unless payment is made before, will be sold on Monday, the seventh day of September, 1877, to pay the delinquent assessment, together with costs of advertising and expenses of sale. By order of Board of Directors.

O. H. BOGART, Secretary.  
Office—Room 1, No. 402 Montgomery Street, San Francisco, California.

## Excelsior Silver Mining Company.

Location of principal place of business, San Francisco, California. Location of works, Potosi District, Lincoln County, Nevada.

Notice is hereby given that at a meeting of the Board of Directors, held on the tenth day of July, 1877, an assessment of ten cents per share was levied upon the capital stock of the corporation, payable immediately in U. S. gold and silver coin, to the Secretary, at the office of the company, 306 Post Street, San Francisco.

Any stock upon which this assessment shall remain unpaid on the tenth day of August, 1877, will be delinquent and advertised for sale at public auction, and unless payment is made before, will be sold on Monday, the twenty-seventh day of August, 1877, to pay the delinquent assessment, together with costs of advertising and expenses of sale.

W. A. KOLLMYER, Secy.  
Office, 306 Post Street, San Francisco.

## Mariposa Land and Mining Company.

California—Location of principal place of business, San Francisco, California. Location of works, Mariposa County, California.

Notice—There is delinquent upon the following described stock, on account of assessment, No. 11, levied on the sixth day of June, 1877, the several amounts set opposite the names of the respective shareholders, as follows:

Names.	No. Certificate.	No. Shares.	Amount.
Adams, Thomas.	1164	100	\$100 00
Adams, Thomas.	A 3	50	50 00
Ambleman, Edgar M.	1496	100	100 00
Ambleman, Edgar M.	1528	100	100 00
Ambleman, Edgar M.	1602	100	100 00
Ambleman, Edgar M.	1634	100	100 00
Ambleman, Edgar M.	1635	100	100 00
Ambleman, Edgar M.	1636	100	100 00
Ambleman, Edgar M.	1637	100	100 00
Ambleman, Edgar M.	1638	100	100 00
Brumagim, J. H.	1117	100	100 00
Brumagim, J. H.	1118	100	100 00
Brumagim, J. H.	1119	100	100 00
Brumagim, J. H.	1120	100	100 00
Brumagim, J. H.	1121	100	100 00
Brumagim, J. H.	1122	100	100 00
Brumagim, J. H.	1123	100	100 00
Brumagim, J. H.	1124	100	100 00
Brumagim, J. H.	1125	100	100 00
Brumagim, J. H.	1126	100	100 00
Brumagim, J. H.	1127	100	100 00
Brumagim, J. H.	1128	100	100 00
Brumagim, J. H.	1129	100	100 00
Brumagim, J. H.	1130	100	100 00
Brumagim, J. H.	1131	100	100 00
Brumagim, J. H.	1132	100	100 00
Brumagim, J. H.	1133	100	100 00
Brumagim, J. H.	1134	100	100 00
Brumagim, J. H.	1135	100	100 00
Brumagim, J. H.	1136	100	100 00
Brumagim, J. H.	1137	100	100 00
Brumagim, J. H.	1138	100	100 00
Brumagim, J. H.	1139	100	100 00
Brumagim, J. H.	1140	100	100 00
Brumagim, J. H.	1141	100	100 00
Brumagim, J. H.	1142	100	100 00
Brumagim, J. H.	1143	100	100 00
Brumagim, J. H.	1144	100	100 00
Brumagim, J. H.	1145	100	100 00
Brumagim, J. H.	1146	100	100 00
Brumagim, J. H.	1147	100	100 00
Brumagim, J. H.	1148	100	100 00
Brumagim, J. H.	1149	100	100 00
Brumagim, J. H.	1150	100	100 00
Brumagim, J. H.	1151	100	100 00
Brumagim, J. H.	1152	100	100 00
Brumagim, J. H.	1153	100	100 00
Brumagim, J. H.	1154	100	100 00
Brumagim, J. H.	1155	100	100 00
Brumagim, J. H.	1156	100	100 00
Brumagim, J. H.	1157	100	100 00
Brumagim, J. H.	1158	100	100 00
Brumagim, J. H.	1159	100	100 00
Brumagim, J. H.	1160	100	100 00
Brumagim, J. H.	1161	100	100 00
Brumagim, J. H.	1162	100	100 00
Brumagim, J. H.	1163	100	100 00
Brumagim, J. H.	1164	100	100 00
Brumagim, J. H.	1165	100	100 00
Brumagim, J. H.	1166	100	100 00
Brumagim, J. H.	1167	100	100 00
Brumagim, J. H.	1168	100	100 00
Brumagim, J. H.	1169	100	100 00
Brumagim, J. H.	1170	100	100 00
Brumagim, J. H.	1171	100	100 00
Brumagim, J. H.	1172	100	100 00
Brumagim, J. H.	1173	100	100 00
Brumagim, J. H.	1174	100	100 00

Name.	No. Certificate.	No. Shares.	Amount.
Otis & Co., F. A.	1320	100	100 00
Otis & Co., F. A.	1321	100	100 00
Oppenheimer Bros.	1605	100	100 00
Oppenheimer Bros.	1606	100	100 00
Oppenheimer Bros.	1607	100	100 00
Oppenheimer Bros.	1608	100	100 00
Oppenheimer Bros.	1609	100	100 00
Oppenheimer Bros.	1610	100	100 00
Oppenheimer Bros.	1611	100	100 00
Oppenheimer Bros.	1612	100	100 00



## Iron and Machine Works.

### PACIFIC ROLLING MILL COMPANY,

SAN FRANCISCO, CAL.

Established for the Manufacture of  
RAILROAD AND OTHER IRON

Every Variety of Shafting,  
Embracing ALL SIZES of  
Steamboat Shafts, Cranks, Piston and Con-  
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Hammered Iron of Every Description and Size

Orders addressed to PACIFIC ROLLING MILL  
COMPANY, P. O. Box 2032, San Francisco, Cal., will re-  
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The highest price paid for Scrap Iron.

### THE RISDON Iron and Locomotive Works,

INCORPORATED.....APRIL 30, 1868  
CAPITAL.....\$1,000,000.

LOCATION OF WORKS:

Corner of Beale and Howard Streets,  
SAN FRANCISCO.

Manufacturers of Steam Engines, Quartz and Flour  
Mill Machinery, Steam Boilers (Marine, Locomotive and  
Stationary), Marine Engines (High and Low Pressure).  
All kinds of light and heavy Castings at lowest prices.  
Cams and Tappets, with chilled faces, guaranteed 40 per  
cent. more durable than ordinary iron.

Directors:

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Wm. Norris, Wm. H. Taylor, J. B. Hagglin,  
James D. Walker.

WM. H. TAYLOR.....President  
JOSEPH MOORE.....Vice-President and Superintendent  
LEWIS R. MEAD.....Secretary

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### ÆTNA IRON WORKS,

MANUFACTURERS OF

### IRON CASTINGS and MACHINERY

OF ALL KINDS.

Fremont Street, Bet. Howard and Folsom

SAN FRANCISCO.

### SHEET IRON PIPE.

### Risdon Iron and Locomotive Works

Corner Howard and Beale Streets,

Are prepared to make SHEET IRON and ASPHALTUM  
PIPE, of any size and for any pressure, and contract to  
lay the same where wanted, guaranteeing a perfect work-  
ing pipe with the least amount of material.

Standard sizes of Railroad Car Wheels, with special pat-  
terns for Mining Cars. These small wheels are made of  
the best Car Wheel Iron, properly chilled, and can be  
fitted up with the improved axle and box—introduced by  
this company, and guaranteed to outlast any other wheels  
made in this State.

All kinds of Machinery made and repaired.

JOSEPH MOORE, Superintendent.

### SACRAMENTO BOILER WORKS,

37 Fremont St., cor. Mission, S. F.

### HALL & KELSHAW,

PRACTICAL BOILER MAKERS,

Marine, Stationary and Portable Boilers, Smoke Stacks,  
Hydraulic Pipe, Oil or Water Tanks, Ore and  
Water Buckets, Gasometers, Orders, Bridges  
and Iron Ship Building.

### ALL KINDS OF SHEET IRON WORK.

Repairing promptly attended to at the  
lowest possible terms.

### STEAM ENGINES AND BOILERS

Of all sizes—from 2 to 60-Horse power. Also, Quartz  
Mills, Mining Pumps, Hoisting Machinery, Shafting, Iron  
Tanks, etc. For sale at the lowest prices by

J. HENDY, 49 and 51 Fremont Street, S. F.

### Miners' Foundry and Machine Works, CO-OPERATIVE,

First Street, bet. Howard and Folsom, San Francisco

Machinery and Castings of all kinds.

### McAFEE, SPIERS & CO.,

BOILER MAKERS AND  
GENERAL MACHINISTS,  
Howard between Fremont and Beale Sts., San Francisco

## PACIFIC IRON WORKS,

First and Fremont Streets, between Mission and Howard, San Francisco, Cal.,  
RANKIN, BRAYTON & CO.,

MANUFACTURERS OF

ENGINES, BOILERS, MARINE AND STATIONARY. PUMPING, HOISTING AND MINING MACHINERY  
INCLUDING BATTERIES, AMALGAMATING PANS AND SETTLERS, CONCENTRATORS, ORE FEEDERS,  
CRUSHING ROLLS AND ROCK BREAKERS. ALSO, WATER JACKET SMELTING FURNACES,  
FOR REDUCING LEAD, SILVER AND COPPER ORES, QUICKSILVER FURNACES,  
RETORTS AND CONDENSERS, ROASTING AND CHLORIDIZING FURNACES,  
SUGAR MILL MACHINERY, WATER WHEELS, Etc., ALL OF THE  
LATEST AND MOST IMPROVED CONSTRUCTION.

Agents for the Allen Engine Governor, Cook's Boiler Feeder and Heater, Buckminster  
Rock Drill and Air Compressors, Wheeler's Ore Breaker, Etc.

GEO. W. FOGG, Supt.

## HAWKINS & CANTRELL, MACHINE WORKS,

210 and 212 Beale Street, bet. Howard and Folsom Sts., - - San Francisco.

Manufacturers of

## IMPROVED PORTABLE Hoisting Engines,

For Mining and Other Purposes.

Steam Engines and all Kinds of Mill and Mining Machinery.

### PHELPS MANUFACTURING COMPANY,

Manufacturers of all kinds of

Wharf and Bridge Bolts, Railroad Trestle  
Work, Car Frames and Bolts, Machine  
Bolts, Set Screws and Tap Bolts,  
Lag or Coach Screws.

ALL STYLES OF FANCY HEAD BOLTS.  
HOT AND COLD PRESSED HEXAGONAL AND  
SQUARE NUTS, WASHERS, BOLT ENDS,  
TURNBUCKLES, ETC., ETC.

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Light and Heavy Castings of Every De-  
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Lynch's Ventilating and Illuminating Tile,  
The Only Illuminating Tile Manufactured for Light-  
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All kinds of Brass, Composition, Zinc, and Babbitt  
Metal Castings, Brass Ship Work of all kinds, Spikes,  
Shcathing Nails, Rudder Braces, Hinges, Ship and Steam-  
boat Bells and Gongs of superior tone. All kinds of Cocks  
and Valves, Hydraulic Pipes and Nozzles, and Hose Cou-  
plings and Connections of all sizes and patterns, furnished  
with dispatch. PRICES MODERATE. J. H. WEED. V. KINGWELL.

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### BIRCH, ARGALL & CO.,

Builders of QUARTZ, SAW AND FLOUR MILLS,  
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THE ECONOMY HYDRAULIC HOIST FOR STORES,  
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## Machinery.

### The Ingersoll Rock Drill



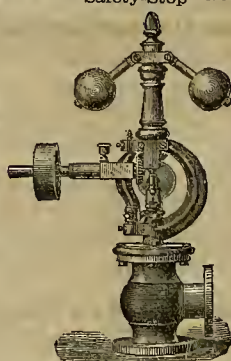
Is Extensively Used in the East and

TAKES THE PLACE OF ALL OTHERS,  
Wherever introduced, because it can be run with less  
power, labor and repairs, and do more work than any  
other drill in the market. It has but few parts, is easily  
handled, being light, and has AUTOMATIC FEED, which  
saves labor. WE ASK FOR TRIAL AGAINST ANY  
COMPETITOR. For particular information regarding  
Drills or Air Compressors, send for circular to

J. B. REYNOLDS,  
320 Sausome Street  
(Room 10.)

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MORE THAN TEN THOUSAND NOW IN USE.  
EVERY ONE WARRANTED.



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PRICE LIST.

When all others fail, buy a "Gardner." We have  
all sizes of these celebrated Steam Governors on hand  
at all times.

BERRY & PLACE,  
Selling Agents for the Pacific States,  
Cor. Market & Fremont Sts., S. F.

### THE O'HARRA CHLORIDIZING FURNACE

Guaranteed to Chloridize from 85 to 95 per cent. of any  
gold or silver ores that are not more profitable for smelt-  
ing. Will also desulphurize ores and put them in proper  
shape for working in cupola furnaces.

Cost of Roasting and Chloridizing 20 Tons  
in 24 Hours by this Process:

One man.....	\$ 4 00
One man.....	3 00
Wood—21 Cords at 38 per cord.....	5 25
Salt—1,600 lbs at 2½ cents.....	40 00

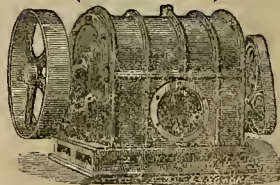
Cost of 20 tons.....\$52 25  
Cost of one ton.....2 61½

In a furnace of three or four times this capacity the  
cost is decreased by 20 per cent.

The furnace is now working successfully at the Poe Con-  
solidated Co.'s mines, in Peavine District, Nev., and at  
the Exchequer mill, Alpine Co., Cal. For further infor-  
mation, apply to

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Reno, Nevada.

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WARRANTED SUPERIOR TO ANY OTHER.  
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51 Fremont Street, S. F.

### THE LANE & BODLEY COMPANY,

John and Water Sts., Cincinnati, O.,

Sole Manufacturers of

BRUCKNER'S PATENT  
REVOLVING FURNACE,  
For Chloridizing, Desulphurizing and  
Roasting Ores.

—ALSO—

STEAM ENGINES, SAWMILLS, SHAFTING, GEAR-  
ING AND MINING MACHINERY.

Send for our Illustrated catalogue.

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GISTS' GLASSWARE AND SUNDRIES, Etc.

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We would call the special attention of Assayers, Chem-  
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etc., manufactured by the Patent Plumbago Crucible  
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Also, to our large and well adapted stock of

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Having been engaged in furnishing these supplies since  
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Our Gold and Silver Tables, showing the value per  
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Deposits of bullion received, melted into bars, and re-  
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Bullion can be forwarded to this Office from any part of  
the interior by Express, and returns made in the same  
manner.

Careful Analysis made of Ores, Metals, Soils, Waters,  
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upon. Consultations on Chemical and Metallurgical  
questions.

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21 First Street, 3 doors from Market, S. F

Ores worked by any process.

Ores sampled.

ASSAYING in all its branches.

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WORKING TESTS MADE.

Plans furnished for the most suitable process  
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E. HUHN  
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### INSTRUCTIONS IN ASSAYING,

Chemical Analysis, Determination of Minerals, and use  
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Will receive a few pupils at his new laboratory, No. 617  
Montgomery Street, up-stairs. TERMS MODERATE.

### STRONG & CO.,

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10 STEVENSON STREET, S. F.

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Patent Riveted

Clothing,

14 & 16 Battery St.,  
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These goods are specially  
adapted for the use of  
FARMERS, MECHANICS,  
MINERS, and WORKING  
MEN in general. They  
are manufactured of the  
Best Material, and in a  
Superior Manner. A trial  
will convince everybody of  
this fact.

Patented May 12, 1873.  
USE NO OTHER, AND INQUIRE FOR THESE  
GOODS ONLY.



TWELFTH INDUSTRIAL EXHIBITION,

UNDER THE AUSPICES OF THE

MECHANICS' INSTITUTE, SAN FRANCISCO, AUGUST 7th, 1877.



The Board of Managers have the honor to announce that the TWELFTH EXHIBITION will be opened to the public on TUESDAY, AUGUST 7th, 1877, and continue open for at least 30 days thereafter. The Exhibition will be held in

THE GRAND PAVILION,

Market, Eighth and Mission Streets, and easily accessible by six lines of City cars.

THE EXHIBITION BUILDING---EXOTIC GARDEN---MECHANICAL ANNEX.

The BUILDING is 200 feet wide, 550 feet long, and 100 feet high, with a gallery around the inside 50 feet wide, beside a promenade 16 feet wide and 1,000 feet in length, from which an unobstructed view of the interior is obtained. In addition to the above space there will be an EXOTIC GARDEN, 70 by 220 feet, for the display of the Fruits and Flowers of this Coast. Also, A MECHANICAL ANNEX, 200 by 50 feet, for the display of special Machinery. A large and powerful engine will furnish the motive power for all machinery required to be in motion, while steam and water will be supplied in ample quantities to such machines or appliances as require them. The main line of shafting is 500 feet in length, with sufficient pulleys for all requirements.

THE ART GALLERY

Is 400 feet in length and 50 feet wide, well lighted by skylights during the day and at night by the most improved reflectors. It will be made specially attractive, both in Pictures and Statuary. Many noted works of art are already promised, and it is confidently expected this department will excel anything ever before seen on this coast. Over 6,000 gas lights will be used to illuminate the building during the evening. Four thousand seats will be provided for visitors. Also, a first-class restaurant, where refreshments of all kinds can be obtained at moderate prices.

A GRAND INSTRUMENTAL CONCERT

Will be given each afternoon and evening by an orchestra composed of the best musical talent on this coast, and under the leadership of an experienced and popular conductor.

PREMIUMS.

In accordance with the general request of exhibitors, the management have decided to offer liberal premiums at this Exhibition, consisting of medals and cash, all to be for the first degree of merit only. The medals will be of a new design, three and one-half inches in diameter, and similar to those awarded at the late Centennial exhibition.

A carefully prepared classified list of premiums will shortly be published.

Articles may be entered for competition or for exhibition only; if for the former they must be so designated when placed in position.

It is important that all parties intending to contribute to this Exhibition should give early notice of the amount and kind of space required.

A copy of the premium list, blank applications for space, rules and regulations, and any information regarding the Exhibition will promptly be given or sent by addressing the Secretary of the Twelfth Industrial Exhibition, San Francisco, Cal.

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Under the heading of the first chapter, "Testing Ores for Silver," we find paragraphs on ore formation, test for silver, with heat and water, acid or blow pipe. In speaking of testing for a process, the extent and richness of ore is considered, smelting ores, selecting and working sample, appliances for testing, roasting, etc. Under the head of "Working Ores" the author describes Aaron's process, bas something to say of superheated steam, preparation of dichloride of copper and protochloride of copper, use of copper and iron, quantity of chemicals, carbonate of lime, chloride ores, amalgam, Patehen's process, etc. He also describes the methods of working roasted ores, treatment of base metals, stirring, heat of furnace, want of sulphur, etc. Under the head of "Leaching Processes" are the titles, Smelting, Mexican process, Chilean process, Kroschke's process, etc. Under "Pulverizing Machines" are described the arastra and its construction and operation, stamp batteries, screens, Crocker's trip-hammer battery, Paul's pulverizing barrel, Kendall's battery, Noice's pulverizer, a cheap rock breaker, etc.

In speaking of amalgamators the author describes a cheap amalgamator, grinding the ore, directions for making a barrel, preventing mechanical wear, use of quicksilver, copper in bars, Freiberg barrel, cheap barrel trough, barrel on rollers, Aaron's amalgamator, separator, etc.

He describes an improvised retort, roasting furnace, furnace tools and furnace building. Among the miscellaneous mention may be found Aaron's leaching apparatus, with two or three different arrangements, a small mill, sampling tailings and settling tanks, dichloride of copper, etc. Mr. Aaron is a practical miner, of long working experience on this coast.

The book is a serviceable one for miners' and prospectors' use. Price, post free, \$2.00. Address Dewey & Co., MINING AND SCIENTIFIC PRESS, 224 Sansome Street, San Francisco.

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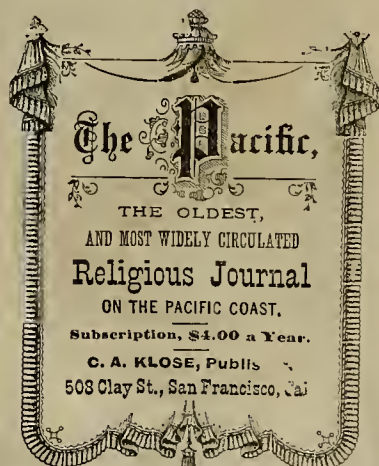
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# MINING AND SCIENTIFIC PRESS.

An Illustrated Journal of Mining, Popular Science and General News.

BY DEWEY & CO.,  
Patent Solicitors.

SAN FRANCISCO, SATURDAY, AUGUST 11, 1877.

VOLUME XXXV.  
Number 6.

## Locating and Describing Mining Claims.

Who May take up Claims on the Public Lands and How it Should be Done.

The Colorado Springs Gazette, of recent date, contains an article directing minors as to the mode of procedure proper to be observed in the locating of claims, illustrating the same with a diagram, and which, if the subject had been treated a little more fully, as we purpose doing in the present writing, would have been of great service to the prospector.

The law enacted by Congress, May 10th, 1872, the provisions of which are still in force, declares all mineral deposits in land belonging to the United States to be free and open to exploration and purchase, and the lands in which such deposits are situated to also be free and open to occupation and purchase by the citizens of the United States, and by those who have declared their intention to become such, under regulations prescribed by law, and according to the local customs or rules of miners in the mining district where such deposits are situated, in so far as such rules and customs are applicable and not inconsistent with the laws of the United States.

Under the term mineral deposits is here intended to be included every kind of metal and mineral, gold, silver, iron, tin, coal, salt, sulphur, etc., though the quantity of land that may be claimed, and the provisions under which it is to be secured and held, vary somewhat with the character of the deposit taken up.

### Violating the Statute.

This law, as will be seen, is very clear and specific as to the class of persons who are to be permitted to enter upon and occupy the public lands for the purposes of mining. They must either be citizens of the United States or persons who have declared their intention to become such; no others have any right to explore or purchase the mineral deposits on the public domain, nor yet, according to a strict interpretation of the law, to be in the occupation of the lands in which such mineral deposits are found.

There are at the present time not less than 50,000 people engaged in mining on territory belonging to the United States, who are not citizens, and who have never declared their intention to become such, being, in fact, ineligible to naturalization. We refer, of course, to the Chinese, who, for more than a quarter of a century, have been suffered to mine on the public domain, except as they were prohibited from doing so by the local regulations of certain districts, and who of late years have been pouring into the mineral regions by every avenue of travel, and there, either through location or purchase, have possessed themselves of mining claims without let or hindrance.

The prohibitory clause quoted was engrafted upon the statute regulating this subject; with special reference to this class of foreigners, who it was not intended by Congress should be allowed to enter upon our mineral-bearing lands, and there quietly appropriate and carry away their valuable contents to their rapid impoverishment and the prejudice of our own citizens. To read this statute by the purpose of its framers, it would declare in the most positive terms that no person of Mongolian origin shall be permitted to mine upon or even occupy this portion of the public domain. It will be observed that the law declares that this class of persons shall not only be debarred from exploring and purchasing these mineral lands but also from their occupation. They have no right to be on them. Their very presence is a trespass, since they are there inferentially for the purpose of mining; and why these intruders upon our common heritage have not been sooner ejected therefrom is a matter that those intrusted with the execution of the law should feel called upon to explain.

Supposing the party desirous of taking up a mining claim has a legal right to do so, he will first examine and see that there is no valid prior claim in the way. There being none, and the location to be made being on a lode or vein, he will ascertain as near as may be where is the most valuable portion of the same and there place his central stake, due regard being

had to the natural facilities that exist for exploration and ore extraction.

Under existing laws 1,500 feet or less, but no more, may be taken up on any lode or vein by one person or company, the number of feet claimed to be stated on the notice, which must be signed by all the claimants, and set forth how many feet are claimed on each side of the central post or stake on which the notices are affixed and the direction in which the same extends. For this purpose, the following form might answer, heading the same:

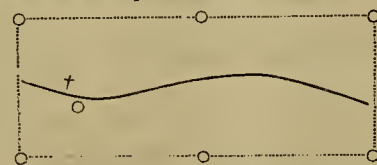
### Notice!

We hereby give notice that we have this day of —, A. D. 187—, located this the (here insert the name of the ledge or vein, and also of the claim taken up). We claim 1,500 feet in and along the vein, linear and horizontal measurement. We claim 1,200 feet along the vein running in a northwesterly course from this central stake and notice (or discovery shaft if one has been sunk), and 300 feet running along the vein southeasterly from the same. We also claim 150 feet, on each side of this vein from center of crevice, as surfaces ground.

A. B. } Locators.  
C. D. }

It would also be well to mention in the notice the name of the district, if one has been organized, in which the claim is located.

As the law requires that all locations shall be



so distinctly marked on the ground that their boundaries can be readily traced, locators should be careful to describe them by reference to such permanent natural objects as may be in the vicinity, and also put up centrally and at all angles large posts, indicating clearly the outlines of their claims, as shown in the above diagram.

The curved line running centrally across the cut denotes the position and course of the vein; the cross above it the site of the location post or stake, and the circle below that of the discovery shaft. Stone or other durable monuments may be substituted for posts, or these may be made to supplement the use of the latter where considered necessary. The more readily a location can be identified by such description and monuments, the more secure the claimant's title.

The old practice of setting forth in the location notice a claim to all the spurs, dips, angles, etc., of the ledge, is superfluous, since these are declared to belong to it by the law.

### Recording Claims.

Within 20 days, or what under the circumstances might be considered a reasonable time, after making the location, notice thereof, fully describing the claim, must be filed for record with the district Recorder, or if there be none,

then with the Recorder of the county in which the claim is situated.

### Expenditures Required.

Within one year from the time that a claim is located, whether it contained 1,500 feet or less, \$100, at least, in work or improvements must be expended upon it, and the same every year thereafter until it is patented. Where there is more than one claimant interested in a location, this expenditure may be made on any one or more of the joint claims, or on a tunnel designed for their development. From this provision, claims located prior to May 10th, 1872, are excepted; an annual outlay of \$10 for every 100 feet answering in this case. Failure to make this required expenditure as above stated, renders all claims liable to relocation. If locators fail to make the proper expenditure within the year, but do it before any relocations made, they will save their claims.

### Blind Lodes.

As no claim can be recorded till the vein or lode has been discovered within its limits, the claimant must, when it cannot be traced on the surface, open the ground sufficiently to determine its presence, and, if possible, also its course, as a means of enabling him to fix his surface location. Applicants for patents for lode or vein locations pay at the rate of \$5 for every acre and fractional part of an acre contained therein.

### Placer Claims.

Of placer grounds, no person can take up more than 20 acres, and no association or company, which shall be composed of at least eight bona fide locators, more than 160 acres, the government prices of placer mines being fixed at \$2.50 per acre. The proceedings to be observed in taking up and securing this class of locations, and in obtaining patents therefor, are, in the main, similar to those required in the case of vein mines, the amount of work demanded to be done upon them being governed by local regulations.

As a means of posting himself fully in regard to the laws governing these matters and the locating of coal and various other mineral producing lands, every miner should procure a copy of the United States laws lately compiled and for sale at the office of this paper.

The Mionietta Belle has been listed on the San Francisco Stock and Exchange Board. The mine is in Inyo county, and is at present furnishing ore to a ten-stamp mill. It is claimed that there is now on the dumps and in the stopes a value of \$200,000 in ore, and it is expected that \$30,000 per month will be produced for some time. The company own three mines.

The Virginia Chronicle says: The recent advance in the price of quicksilver will increase the cost of milling silver ores by about \$1 per ton, and the opinion of well-informed parties is that the price will go still higher. The average loss of quicksilver in working ores by the Washoe process is two pounds per ton.

## Cochrane's Improved Cam.

The illustration given herewith shows an improved cam for quartz mills, invented by T. A. Cochran. This sectional cam has been thoroughly tested and proved to be a success, and is indorsed by the most experienced mill-rights and millmen on the coast.

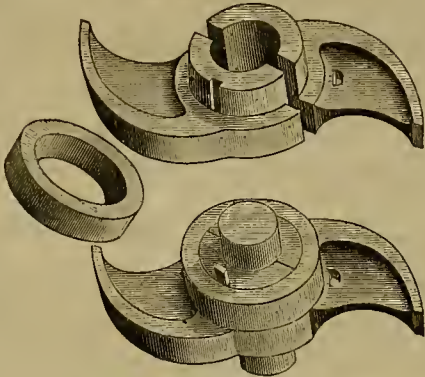
A good and successful sectional cam has long been wanted to make the battery a more perfect machine. Like the gib lappet, it takes the place of the crude and old-fashioned concern that was always getting loose and causing stoppage of this mill and consequent loss of time and money. One of the most important claims for this cam, is its reliability and the impossibility of its getting loose when properly keyed to the shaft. The cam is convenient as regards moving and putting on the shaft, and when the key is driven, it secures it firmly, drawing the sections together and forming a firm base for the heavy and constant strain of the cam. The old cam has its key driven next to the shaft, forcing the cam off from the shaft, weakening the hub and leaving it liable to rock on the key and get loose. After it does become loosened, it is necessary to take out the whole shaft and move the other cams to get out the key.

All this trouble is remedied in the Cochrane sectional cam. The sections can be taken off and new ones put in use in fifteen minutes, without moving the shaft or the rest of the cams. The engraving shows plainly how the cam is put on. The ring is slipped over the hub and the key driven between the ring and hub. The cam is strong and durable as well as very convenient, and little liable to get loose. Further information concerning this cam may be had from J. Hendy, corner Mission and Fremont streets, the Union Iron Works, Pacific Iron Works, Risdon Iron Works, Miners' or Fulton foundries, or from the inventor, T. A. Cochrane, Morton House, in this city.

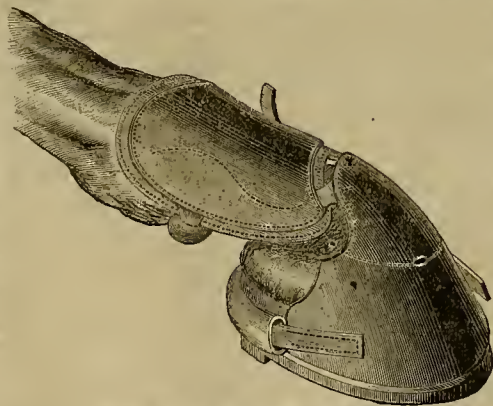
## A New Horse Boot.

An illustration on this page shows a recent claimed improvement in horse boots, which we show as a matter of news and interest to our horse men. The inventor, Mr. J. Fennel, of Cythiana, Kentucky, claims for this device that it protects the greatest amount of flesh and muscle, and yet is not fastened to these tender parts but to the hoof alone. The following description will explain the engraving: This boot is intended for the hind leg and is made in two pieces; the upper or speedy cut part is attached to the corona or hoof part by two small straps, which allow it to yield to every motion required. The speedy cut part is made flaring both upward and downward, and stiffened with a small wrought-iron plate, so that it cannot be crushed down, but should it be thrown out of shape by any cause, it is a very small matter to take it and shape it with the hand, and if found to press or chafe at the top or bottom, bend the plate so as to throw it out, thereby preventing it from producing so much friction upon any one point. There is a small padded strap which passes around and under the fetlock, though of no use only to keep this attachment from falling forward, and should be buckled very loose. This speedy cut extends to about the middle of the fetlock joint, and is well padded inside and is fastened to the hoof part by two small straps. The outside strap is harness leather, the inside is made of three pieces of oil-tanned buckskin, sewed through the center before putting in. Nothing else will stand at this point; the very best harness leather will not stand more than six weeks.

The hoof part is padded at the top to protect the corona, and the two small straps pass into said pad from the speedy cut attachment, which completely combines the two into one. This hoof boot is fastened on like all others, there being a strap to pass around the heel next to the shoe and buckled tight with a small iron hook on outside, which must be passed in between the shoe and hoof. This is to protect the boot from being pushed up.



IMPROVED SECTIONAL CAM.



FENNEL'S IMPROVED BOOT.



### Webber Lake and Its Attractions.

[We copy from the PACIFIC RURAL PRESS the following graphic description of one of our most entrancing mountain retreats. The description should be accompanied by engravings, and should be if, we had photographs or sketches which would enable us to produce pictures worthy of the grand and picturesque views which Webber Lake affords. At some future day we trust our artist may visit the place and give us faithful sketches, from which some idea of the peerless summer scenery of the region may be gained.—EDS. PRESS.]

The hot and long summers with cloudless skies in the great basin of Nevada and the great valley of California, render it very desirable, often necessary, that their inhabitants sometimes escape to the mountains conveniently situated between the two States, where, at the same time, the most delightful climate is experienced.

The highest and most interesting as well as health-giving retreats are inaccessible, however, except by certain gaps or

#### Passes of the High Sierra.

The most noted of these are Walker's pass, near the extreme south end of the Sierra in Kern county; next King's pass, leading to Mts. Whitney, Brewer, Tyndall and other of the highest peaks of California; next, Mono pass, connecting Mono valley and the world-famous Yosemite valley; next, Silver Mountain pass, between that celebrated peak and the Big Trees of Calaveras; next, Carson pass, leading by the crystal, azure-bued, mountain sea of Tahoe; next, Donner pass, where now winds the C. P. R. R. through 40 miles of snow-sheds and 13 long tunnels; next, Henness pass, leading to the varied attractions of the alpine lakes of Webber, Independence and Meadow; next, the low Beckworth pass, at the north end of the large and fertile Sierra valley; next, Fredonier's pass, between Susanville and the high Big Meadows, with their enormous springs; and lastly, Lassen's pass, leading by that lofty perpetually snow-clad peak in Shasta county.

#### Webber Lake and Valley.

Of all the popular resorts found on these passes the highest and prettiest, and that which proves the most satisfactory because most beneficial and cheaply enjoyed, is the noted mountain gem of Webber lake, a snow-formed, crystal sheet of water reposing in a gently sloping, basin-shaped, forest-clothed valley, occupying the highest part of the well known Henness pass through the high Sierra, 20 miles north of Donner pass and the railroad.

Webber lake is nearly circular in shape, about a mile in diameter, and nearly 7,000 feet above sea level in Lat. 39½° north by Long. 129½° west, hence the region is sub-alpine, the scenery peculiarly grand, the flora rare, often new to science, the forest open with no impeding chaparral, the fishing and hunting unexcelled, the climate cool and health-giving, the waters pure and delicious, added to all which the entertainment or medical assistance furnished by the proprietor, Dr. D. G. Webber, at his spacious hotel and sanitarium is of the most satisfactory kind, for he is a genial, efficient, liberal-hearted gentleman, and one of the most skillful, sympathetic, benevolent and successful physicians in California.

The forest immediately surrounding the lake is composed exclusively of the graceful *Pinus contorta* or California tamarack, clustered into gravel floored, flower-carpeted groves, affording cool but not gloomy shades and most romantic drives. Outside the groves, investing the bases of the mountains, is a denser growth of the several Sierra pines, decorated on its upper edge by a fringe of the dark green trees of the two rare and exquisite California firs, *Picea grandis* or white silver fir, and very rarely, *Picea amabilis* or red silver fir; the latter only found in limited alpine regions of California and by all observers admitted to be the most lovely evergreen in the world. So beautiful and desirable is it, with its regular whorls of limbs rising like a diminishing series of verdant wings, looking a straight shaft, red-painted below and white above, stuck full of immense fans, that its seed sells in London for its weight in gold, and agents of the Prussian and other European governments have been sent here to obtain seed for renewing their forests. Large sections of one of these trees that was 30 feet in circumference, were sent to the Centennial exhibition and elicited universal admiration. Another beautiful and rare tree, *Abies Pattoniani* or silver spruce, is found clinging to the sides of the highest peaks.

This enclosing forest is broken at two points on the north side of the lake by small meadows, lined with willows. Between and nearly enclosed by them extends a symmetrical grove of the tamaracks described, forming a natural site and a fortunate sun-shield for the hotel and accessory buildings, cottages for tourists, etc., located in a line skirting the lake and but a few feet from its shallow, gravel-bottomed shore.

This beautiful grove, for several rods back from, and for a mile along the lake shore, has lately been cleared of hundreds of fallen and uprooted trees, the vestiges of a terrific storm which tore through the valley from south to north several winters ago.

Across the lake at the south end a larger break in the forest is occupied by a broad mea-

dow, extending four miles up the valley and comprising several hundred acres of pasturage annually cropped by thousands of sheep. This meadow, like the floor of the groves, is smooth-laid gravel, affording excellent travel in any direction. Through its center winds a silvery streamlet fresh from snow-banks in sight the year round.

#### Passes to Webber Lake

The jagged mountain rim of the valley is deeply indented at four points by four passes nearly corresponding with the cardinal points of the compass. The low east and west passes are great gateways, for through them proceeds the once densely thronged Henness pass emigrant road; Webber lake, on the summit, being the principal station and half-way camp upon its line.

Down the east pass also flows the outlet of Webber, plunging off a ledge of rock a half mile from the lake and forming a lovely cataract and deep gorge, hereafter to be described.

The high north and south passes open to scenes similar to the Webber, but contrasting each other; the north one, threaded by a trail precipitous at a few places, leads over through a grove of *Picea amabilis* described, and down eight miles to Sierraville and Campbell's sulphur springs, in the south end of the rich and populous Sierra valley, described in last season's "Botanical Excursions," in the *Pacific Rural Press*.

It must suffice for this article to show the relations of Sierra valley to Webber lake. They are connected by the short bridge-trail described and by a good wagon road that skirts the mountain eastward and enters Webber's valley by the east pass, 16 miles. Sierra valley is also noted for its salubrious climate and for its excellent sporting.

Many tourists and families resort there annually, and a hotel costing \$12,000 has been built at the medicinal hot springs near Sierraville and Randolph, by Mr. John Campbell, a genial gentleman and an appreciative, enterprising early settler. Many magical cures are reported, and no doubt these waters are as potent to cure as celebrated springs of the lower valley, and certainly the surroundings are ten times more romantic and pleasant.

Special conveyances are furnished by Mr. Campbell whenever his guests desire to visit Webber lake.

The high south pass leads up by a good wagon road, through a grove of silver spruce, eight miles south and west to Meadow lake and the once populous town of Summit City. The scenery around this truly alpine lake is magnificent. The visitor finds himself amidst snow banks and treeless, bald, white peaks, admitting through their gaps views of other high peaks, the highest in northern California. To revel among these snow banks, bordered with quick-growing, strange and abundant flowers, during the dog-days, is a privilege easily and cheaply obtained by the habitues of Webber, for horses and vehicles are always furnished gratis to visit this and other places of exceeding interest in the vicinity.

The broken roofs of 300 houses tell a sad tale of mining failures and abandonment, but the rock is known to be rich here, only it is loaded with sulphurets. The discoverer of the ledge, Harry Hartley, has never despaired of discovering a process for removing the sulphurets, and now a French chemist has extracted sufficient gold from the rock at a rate so cheap as to inspire parties in San Francisco to invest large amounts of capital in claims and mills at Meadow lake; so the future is bright for the mines and the pleasure resort of its citizens, as of yore—Webber lake.

#### Peaks around Webber Lake.

Between the four passes described arise lofty mountains, easily climbed, and affording grand views of bare, glistening, towering peaks, with myriads of shining lakes nestling at their bases. To the southeast 10 miles, only a half-day's ride away, towers among a noble group of peaks, Mount Lola, on which is placed one of the signal stations for central California, communicating with Mount Diablo; and beyond a few miles the startling ruins of an immense castle are reared against the sky. To the southwest appears the hump-backed peak which has named itself Old Man, overlooking Meadow lake. Further south and east extend the culminating crests of the Sierras, the view ending with Job's, Tellac and Pyramid peaks, far beyond Tahoe. To the west is the black, frowning French peak, girt about with lakes, and standing out in full view of denizens of the great valley. In the northwest sky looms the sharp, many-toothed comb of Downville buttes, about 20 miles away. Further north and a little east is Haskell's peak, overlooking Sierra valley. Still further northwest, among continuous crests of the Sierra, are Saddleback, Table-rock, and Fir-top, their peculiarities distinctly visible, while away over them, 90 miles north, appearing like a vast iceberg on the horizon, shines the snow-clad, historic Lassen's peak, its sides gullied by numerous avalanches, revealing its black body of lava.

#### Short Trips at Webber's.

One of the first trips taken by all lovers of nature is performed without waiting for horse or carriage. You jump into a boat and row half a mile to the outlet and dam, then walk another half mile through clean, open woods, by the flower-bordered stream to the cataract and canyon. This beautiful fall is double: first, a plunge of 25 feet into a deep, rock lipped basin, then a sheer cataract in winter or a broken cascade in summer of 85 feet, to the floor at the

head of the deep gorge. A stairway cut in the soft rock facilitates your safe descent to the base of the cascade, where, if you have chosen a morning hour of a sunny day, you may see the misty sheet hedecked with miniature rainbows. The steep-walled gorge winds another half mile before dehouching into Scott's valley. These walls are about 200 feet high, and exhibit countless strata of rock, draped with rare ferns and flowers—an open book of geological records illuminated by floral vignettes. You gather specimens of rock, fern and flower, meditating the while upon the time when the lake above filled all the valley, and querying whether a gradual wearing of ages upon ages has excavated this gorge, or whether a fresher or cloud-hurst of more recent date tore this channel through the then soft rock—a phenomenon similar to and perhaps coeval with, but of course vastly inferior to, the eight-mile canyon of Yosemite.

Another short trip is by boat across the lake to a dense part of the forest, where are hidden, but a few rods from the lake shore, Dr. Webber's Monument, a dome of white granite rising through the trees; and just beyond, Lover's lake, green with reflections of the overhanging trees. This part of the forest is a noted bear haunt, and a log trap is built here for Bruin's inspection.

A third trip is by boat also—always a boat-ride at first—to the ice-cold spring and Botany meadow on the west side of the lake. This spring is singularly cold, too cold to drink until tempered a little by exposure to air or mingled with lake water. A huckelful is always brought back in the boat to regale the stay-at-homes. The meadow is variegated with colors, showing where grow rare and interesting flowers, among them four species of *Gentian*, one a new species; a new *Ranunculus Lemmonii*; a new *Silene montana*; the little *Sagina Linnaei* and a one-flowered clover; the violet-like *Parterella carnosula*, etc., with hosts of more familiar flowers and a near grove of *Picea amabilis*.

A fourth trip is by wagons and saddles to Lake of the Woods, on the top of the mountain back of the hotel. This lake is about 80 rods long and half as wide, completely hidden in the dark forest of fir and tamarack. Beyond it a few rods is a high crest, the Observatory, vertical on the north side, overlooking Sierra valley and the peaks beyond. This trip and the scenery is generally highly enjoyed, especially by the youngsters, who love to tumble rocks down the cliff.

#### Longer Trips at Webber's.

The next four trips are each eight miles long and are connected one with each of the four passes. The first one with horses, the rest with vehicles also, and generally each is made the occasion of a social picnic. The north trip is to Sierra valley and Campbell's sulphur springs; the east one to Independence lake, to revel in the grand scenery of its steep, abruptly enclosing mountains; the third to Meadow lake, with its snow-banks and sublime views of peak and gorge; the fourth is westward to Jackson's old station and the picnic grounds on the Middle Yuba.

#### Excursion to Castle Peak.

Another grand trip, entitled by its extent and diversity to be called an excursion, is often taken by the tourists at Webber's who have the requisite strength and nerve, and in the latter regard ladies have often proved the best campaigners. For this excursion you require strong, trusty animals and an extra one or two packed with provisions for two or three days, blankets, etc. The writer takes this excursion every season, sometimes alone, and is always richly rewarded. Some new lake or glen, generally a new plant, is found every trip. The objective point is Castle Peak, distant about 18 miles south-east, as the bird flies, but to reach it you climb several ridges, traverse innumerable valleys and wind around lakes and peaks in delightful profusion. Chiefest of the interesting objects passed in order are Lookout point and Bear valley, Emerald lake and Sliding rock—the latter weighing many hundred tons has but lately left its ledge on the top of a near peak; White rock peak and lake, the latter shining like molten silver in its granite basin; Mount Lola and the United States signal station, where a party of men remain all summer, telegraphing by a mirror or solstadt to Mount Diablo; Rock basin and Mount Rose, the latter red with the rare *Eriogonum Torreyaeanum*, and lastly the majestic ruined Castle. Each of these objects deserves a page of description, but space forbids. We generally camp the first night in a little valley under the lee of an immense snow-bank on the eastern brow of Mount Rose. This little dell is carpeted in September with the large flowered, purple *Primula suffrutescens*; the few mossy trees of *Picea amabilis* are cushioned around their bases by dense masses of the super, crimson-flowered, spruce-like heather, *Bryanthus Brewerii*, and close up to the snow is found a little willow in full flower and fruit, yet only one and one-quarter inches high. It is *Salix arctica* and is identical with the dwarf willow growing on the shore of the Arctic ocean. By this you get an idea of your elevation, having ascended through all the climates to that of the Polar seas.

Mount Rose and the Castle are connected by a sharp lava ridge of a mile or more. You can ride half way, then tether your animals to jutting boulders and proceed on foot. On this dizzy wind-swept ridge grow rare and curious plants. There is *Eriogonum Douglasii*, forming a hard globe of tufted leaves; *Gilia congesta*, like a velvet lamp-mat; *Astragalus Hookerianus* with

large purple spotted bladderly pods, and over the ridge trailing from the crevices in the lava hangs the large pink-flowered *Epilobium abcordatum*. Your tracks in the snow fill with blood, seemingly. It is the "red snow" of Arctic highlands and, wonderful to state, is a plant *Protococcus*—meaning the first berry *i. e.*, the smallest fruit; well-named, for it is a simple microscopic cell.

Farther on and away up on a narrow ledge on the vertical east wall of the Castle, the writer once spied a yellow-eyed flower peeping down. Digging steps in the soft rock with his botanical pick, he reached the ledge and secured seven plants of a bright flowered *Ranunculus*. It proved a new species—no wonder; it is named *R. oxyotus*.

Slowly you climb on hands and knees now, to the base of the first turret. There in the splintered lava is a new woolly *Astragalus Austine*, named by request, to honor Mrs. Austin, an excellent lady and careful botanist of Quincy, noted abroad for her observations on the insectivorous *Darlingtonia*.

There are three turrets still standing of the old Castle, each 200 feet high. The first is easily scaled, the second is quite difficult of ascent, and the third, the most eastern turret, shaped like a decanter, has seldom been surmounted. The writer climbed it once by removing his boots and wetting his stockings and gloves with snow, to enable him to cling to the round pebbles, half imbedded in the vertical side. The views from these turrets are among the widest and most interesting of any in California, for the Castle is favorably situated at the side of the Sierra and commands its crests for hundreds of miles each way. An easy traveled ridge, six miles long, connects the castle with Summit station, on the C. P. R. R., and facilitates visitation from that source.

#### Amusements at Webber's.

Beside the ever interesting amusement of rowing and sailing on the lake, availing the oft-repeated echoes with shout and song, or casting the long trolling line for trout, or gliding along shoal-water at night with pine-knot light and impaling spear, there are other amusements of a more exciting sort. The roads are so even and hard, free from dust or stones, that visitors having fine animals are always tempted to let them show their points, and many a dash of speed is made on these fine courses that is worthy of record. Then the hunting has often a spice of danger in it, as when a grizzly, perhaps the famous monster self-named by an injury, "Club-foot," is suddenly stirred up from his lair. A few seasons ago five bears were hunted down here in four days—the wildest, most exciting sport imaginable. The entire population of Webber joined in the pursuit of the last one, several ladies riding fearlessly at the front and assisting to bring Bruin to grief.

But the most common, every-day sport at Webber's, enjoyed even by the invalids, if able to sit up, is trout fishing with rods. For this, you row, or sail at certain seasons, over to the inlet, deeply bordered with willows. Early in the season these willows are filled with mosquitos, but they soon disappear, and it should be noted that, except mosquitos for a few days at the beginning of the season, no insect pests of any kind are known at Webber's. In the deep holes of this inlet, extending like a chain for 100 rods up the stream, is often found the best fishing. No skill is requisite for catching trout when they do bite; a little child often hooking more than adults in the same hour, because of its greater nimbleness in baiting hooks and removing fish. As many as 400 fish have been taken by one boat-party in an hour.

#### Opinions of Visitors.

The *Truckee Republican*, in an editorial, said recently: "No lovelier spot is found in all the Sierra for real enjoyment of families and for the skillful care of the sick than Webber lake. It is accessible from this general depot for tourists at Tahoe, and at the same expense of \$3 for stage fare. Webber's four-horse stage runs regularly between the lake and Truckee, 24 miles, three times a week, from June 1st to November 1st."

The *Downville Messenger* says: "Alternating at will between Campbell's sulphur spring and Webber lake, is about the most delightful occupation we know of in dog days."

The *Sacramento Bee* declares "Webber lake is decidedly the most enjoyable and cheapest pleasure resort in California."

A writer in the *Sacramento Union*: "Webber lake's resources, unlike those of Donner and Tahoe, cannot be exhausted by a visit of a day or two, for it is the exact center of more attractions than can be even enumerated in a long paragraph. Stay one day only at Webber, and perhaps you will pronounce it dull. Stay a week, and you will wish to prolong your visit a month. Stay a month, and you will certainly do as I have done, pass the heated term there season after season."

The *Virginia Enterprise* remarks: "We see several in town who have just returned from the usual summer tour of the Sierra lakes. They have fresh and rare insects, herds in their praise of Webber lake. They declare that while each has peculiar attractions, Webber lake combines more for the same money than any other, besides affording by the presence there of a skillful physician, the good Doctor W., a sure relief for invalids."

#### Distinguished Visitors.

Among the eminent scientists who have lately visited the lake, may be mentioned the California artist, Mr. Hill, who spent a season here transferring the scenery to his canvases; the well-known traveler and microscopist, Dr. Harkness, who has passed two summers here; the eminent entomologist and author, the Russian Baron Von Osten Sacken, who collected many new and rare insects here last fall; and the veteran botanist and tireless explorer, Dr. Parry, with his noble wife, rendering sacred forever the halls and groves of Webber lake.

The Baron writes this winter: "Please present my profound regards to Dr. Webber and Mrs. Anderson, under whose hospitable roof I spent a delightful fortnight."

Dr. Parry writes: "Three bright scenes will ever remain prized memories of our late visit to California. Crater Retreat, near the base of old San Bernardino, Santa Barbara by the sounding sea, and Webber lake up in the Sierra."

#### Routes to Webber Lake.

The best and cheapest route to Webber's for most per-

Continued on page 86.



## MECHANICAL PROGRESS.

## Cold-Punched Nuts.

Our English friends were quite surprised at the American nuts shown at the Centennial and they are free to express their appreciation of our progress in this line of manufacture. A volume of the reports of British Centennial Commissioners has recently been submitted to Parliament, which embraces the following interesting reference to the novelty of cold-punched nuts: "The articles shown consisted chiefly of nuts or other similarly perforated specimens; all were of remarkable beauty, and were given away in great profusion. These nuts had two peculiarities—they were of inordinate depth; and showed clearly that they had been punched cold. Visitors, however, did not hail this new fact in practical science; they said it was an impossibility for a 3-inch punch, however good the quality of steel, to penetrate through 1½ inch of cold iron; that, whatever might be the explanation, a punch of that diameter could not do it without being broken or crippled."

"In time the secret leaked out, for it was no imposture. The makers, in punching, take advantage of the fluid property of solid cold iron or steel, by introducing the element of time into the performance of the operation, giving to the punch only such a load of pressure as it can comfortably sustain, then giving up the reins to nature, when the instrument penetrates at a rate dependent on, and in proportion to, the fluidity of the mass. Hitherto the philosopher and the experimentalist have been writing upon the flow of solids, no one heeding; but here at the Centennial was the natural law made practically available; and, unimportant as it may seem, yet vast issues are bound up therein. The seed there sown in thousands of thinking minds will bring forth many other applications in metal working, and will lead to the performance of many operations that are deemed impossible at the present time."

WHAT IS NEEDED TO DRIVE AN ENGINE.—People are willing to grant the locomotive engineer a good share of courage to stand firm in his perilous position. He also has need of the fine senses. We read an article, written by an engine driver in an English paper, from which we quote as follows: A locomotive foot-plate is the only place in which practical illustrations can be obtained of every way in which it is possible for an engine and engine-man to go wrong. During the time an engine is under steam with a train, everything seen, heard, felt and smelt in connection with it is capable of conveying information to the driver—of teaching him that the secret of successful locomotive driving is close observation, and that no man can on any other terms handle the regulator with confidence. On the foot-plate the eye is taught or trained to distinguish colors at a distance; the ear learns to detect the slightest variation in the beats of the exhaust. Cognizant of a daily deterioration of a piston ring, it learns also to distinguish the difference between a valve and a piston "blow," an axle-box knock from a knock in the journal. The human frame learns to decide what oscillations and pitchings are due to a defective spring and what are due to a defective permanent way; the nose becomes, from experience acquired under all kinds of circumstances, very sensitive, so that it can detect the rising of fire, either in the lagging of the boiler from a spark, or in the axle-box from friction, even before any mischief from mentioning is accomplished. It is under steam and speed combined that the "coral reefs" and "sand banks" on railways can be seen and marked upon the driver's chart. There are upon all lines trap-points, trap-sidings and gulleys put in for the safety of the public, which, if an engine driver is thoroughly acquainted with them, are as surely capable of wrecking an engine as is a hidden rock a stately ship. The rank and value of every locomotive engineer is exactly in proportion to the labor and study he has bestowed on the matter.

KEEPING OUT DUST AND CINDERS.—We read that the Rev. A. LeRoy's simple attachment to railroad coaches, for the purpose of excluding dust and cinders when the windows are open, is now undergoing a test on the Wagner drawing-room cars of the Central road. On a recent trip during a storm it was found that the apparatus excluded rain as well as dust, an outward current from the car keeping all drops from those sitting near the window. The invention is simply a series of slats less than four inches in width attached to the sides of each window. When not in use they are folded compactly against the sash. The slats on the front side of the sashes are let down when the train is running and those in the rear are closed. So perfectly does it do its work, says a New York paper, that a handkerchief held in the lap before an open window will not show a speck of dust or cinders in a ride of many miles.

CLAY TIE.—A railroad tie made of potter's clay is the patented inspiration of Mr. G. W. Chaudler, of Boone, Iowa. The clay seemingly a rather yielding material in its natural state, is to be "burned hard as flint," in sections about a foot in length, which will then be bolted together with iron. The result seems to be the equivalent of stone, although stone sleepers were long ago discarded.

## Weighing the Strength of Wire.

The prosecution of the work on the Brooklyn bridge, is calling out several special devices. One is a testing machine for the strength of the wire, and it is adapted to test up to a tension of 10,000 pounds. It was made by Messrs. Riehle Bros., of Philadelphia. Among the general points of the design, which the *Iron Age* thinks worth noticing, are the keeping the levers in position so as to resist a shock quickly without injury, and with little wear; while very sensitive it is easily and quickly controlled, whether operated by steam or hand. A specimen can be tested without cutting it from the coil, and the length of the test piece may be one foot or five according as a long or short piece is needed.

No preparation is needed to hold the wire, as it is introduced at once directly to the center of the vises and held firmly without screw or application of the hammer. Tests can in this way be made with great rapidity and accuracy. The pulleys over which the belts run to main shaft are composed of one loose and two tight ones, which permit the working of the screw backward and forward by merely shifting the belt, which can be readily done by the operator at pleasure, while making the test. The hand-power is applied by means of a ratchet, which also works both ways.

The beams are double, and are provided with gravitating poises. There are two grooved wheels, both behind the center on the inside of the poises, which have the tendency of throwing the knife edges into the notches and holding them there; this is preferable to the spring arrangement. The whole machine is constructed of metal. The screw is made of steel, the beams of red brass, and all the steel fulcrums and bearings are made true and even.

STEAM CARS ON CITY STREETS.—John D. Imboden has perfected a system that is said to work well; we append a description taken from the Philadelphia Times: The engine is an independent sub-motor—a complete machine in itself, and can be attached to any of the present horse cars. It is simple, easily handled, cheap, and, better than all, causes no discomfort to passengers, it being out of their sight, smell and hearing. It has its own frame work, wheels and springs, carries its coal, water and engine, and sustains half the weight of the car and passengers, the other half being carried by a single pair of car wheels, just in front of the rear platform. The car body is pivoted at its front end, on the engine, resting on the bed plate and springs over the boiler. The engine has four driving wheels, with a wheel base of only four feet, and, owing to the simple pivoted connection with the car body, it is capable of curving freely. The boiler is horizontal, with a vertical furnace and steam dome under the driver's seat, which is outside the front of the car. The "test" car has been made the same size as that of an ordinary horse car, so as to demonstrate thoroughly that in order to convert the latter into a locomotive nothing is necessary but to take off its front wheels, put this handy little engine in their place and nail up the front door. The interior and the rest of the car can be left intact. The new car occupies four feet less street space than one of the dummies now in use on Market street, and ten feet less than the horses, they being dispensed with.

PROGRESS OF STREET RAILWAYS.—Mr. John Stephenson, the widely-known street-car builder, gives the following sketch of the early history of street railways in this country: "The Fourth Avenue (Harlem) railway was chartered as a city road in 1831; the first section opened in 1832. Steam, as a motive power for street cars, was used in Fourth avenue, in New York city, as early as 1835, and has continued to be used on that avenue. There were no tramways outside of New York until after 1855. Nor did Philadelphia have a tramway proper until about 1857, at which time tramways were also introduced into Boston. Tramways did not exist outside of the United States until 1860. George Francis Train then commenced such construction in Birkenhead, England, but no other road was made in that kingdom till 1869, and now the chief cities of Europe are enjoying this American luxury. In fact, it is an element of modern civilization adopted in Asia (Bombay and Java) in 1868, South America in 1866 (Rio de Janeiro in 1866 and Buenos Ayres in 1869, and now in every city of importance). Australia is about opening its first tramway, now nearly ready, in the city of Adelaide."

GOOD FOR THE FUTURE.—The American Manufacturer says: At no time has so much attention been given to the rearing of young men for fitness in special branches of trade. Our scientific institutions are furnishing us with young men of excellent technical education, who enter their profession with a valuable stock of knowledge, which enables them to at once become useful and indispensable aids in the prosecution of our great industrial enterprises.

AIR FOR ARMOR PLATING.—Recent experiments at Woolwich have proved that hy far the most efficient protection against chilled iron shot is a thick slice of air inclosed between two comparatively thin armor plates. Thus a four-inch armor plate, placed rather more than four feet in front of a 10-inch plate, was found to have so disintegrated an 800-pound projectile that the hinder plate was hardly bent and had a large dab of metal sticking to it.

## SCIENTIFIC PROGRESS.

## Oligochæta.

At the last meeting of the S. F. Microscopical Society, Dr. Gustaf Eisen, Professor of Zoology, Upsala, Sweden, a corresponding member, called attention to some minute worms of the *Oligochæta* of the family *Tabijicæ*, and exhibited some fine plates of beautiful drawings made by his skillful hand, representing their anatomy. The worms were all found in California, near San Francisco, in the Sierra Nevada, or in the redwood forests along the northern coast, all inhabiting ponds, lakes or even clear-running streams. Of said family, only five genera are known, viz: *Tabifex*, *Psamoryctes*, *Preatotrix*, *Limnodrilus*, and *Thelmatodrilus*. Of those, all except *Preatotrix* were found in California, and one, the *Thelmatodrilus*, was endemic to the waters of the higher Sierra Nevada. The Doctor called attention to some points in their anatomy, and pointed out some characters by which species and genera could easily be distinguished, as in the *Oligochæta* generally no external characters are found and the species must be arranged according to the shape of the interior organs. As a genus characteristic, the suprapharyngeal ganglion is of great value, but as to species characters the generative organs were undoubtedly the best. The organs represented on the drawings were principally the nervous system, the ovaries, the testes, the efferent ducts and the segmental organs, all exhibiting characteristic forms in the different species. The species described were *Limnodrilus crinis medusæ*, *Limnodrilus vejdoerkyi*, *Limnodrilus corallinus*, *Tabifex marbilis*, *Thelmatodrilus alpestris*, and *Psamoryctes Californicus*. Besides these many forms had lately been found, but many more yet were likely to occur in our stagnant ponds or rivers. The Doctor expressed his hope that the members of the society, during their excursions, would capture and preserve all such worms found, and any contributions, however small, should be most thankfully appreciated. Nearly every large body of water contains one or several new forms, and a perfect collection could only be brought up by a diligent search in different parts of the country.

ARE COPPER SALTS POISONOUS?—This is a question commonly supposed to be settled in the affirmative, but a discussion upon it seems to be going on abroad. The *Journal of Chemistry* notes that in a recent communication to the French Academy of Sciences, M. Galippe points out that although the various compounds of copper give rise to a severe vomiting when administered in large doses, the same compounds may be taken for long periods of time in smaller doses, progressively increased, without the occurrence of any unpleasant symptoms. Burg and Ducom fed dogs every day during two months on food which had been cooked and allowed to cool in copper vessels previously exposed to the action of vinegar and salt, without producing any poisonous effects. Galippe himself, for more than a month, lived on food cooked with or without vinegar in untinned copper saucepans, whose contents were often allowed to remain for 24 hours in contact with the metal before they were put on the table. The various dishes thus prepared, though often coated at their edges with the greenish matter commonly termed verdigris, were partaken of, both by himself and by other members of his family, without giving rise to any dangerous or even disagreeable symptoms.

STATUES TO SCIENTIFIC MEN.—An unusual interest is manifested in France at the present in regard to honoring her distinguished men of science by erecting statues to their memory. A statue to Arago is being erected at Perpignan, in the department of Orientales Pyrenees. Another to Nicéphore Niepce, a name well known in connection with improvements in photography, will be erected at Chalons-sur-Saône, his native place, by public subscription, at the instance of the Municipal Council of the city. It is also stated that a public subscription will be opened at Lyons on behalf of Ampere, the inventor of the electro-magnet, and the precursor of Faraday in the invention of the inductive electricity. Ampere was born in that city in 1775, and his father was guillotined there on the Place des Terreaux for having been active in the great royalist rebellion against the Convention, which ended in the famous siege of Lyons and his capture by Dubois-Crance.

SANDSTORM IN ROME.—On June 22d a curious shower of sand and mud, coming from the south, fell in Rome, which seems to be regarded as due to sand brought in a dust-storm from the great desert in Africa, being mixed with the pollen of some vegetable, and held in solution by the cloud which carried it. An artist, writing to the *Times*, says that yellow spots, of about a twentieth of an inch in diameter, were made on the paper on which he was sketching, and also—though the color varied from yellow to white—fine drops of the same diameter fell all about the neighborhood of Rome. The cloud which brought it, though giving out little or no rain, turned the sun at 4 P. M. into the semblance of "a pale moon of greenish tint." Similar phenomena were no doubt mistaken for a rain of blood by the Romans, and regarded as prodigies, ominous of coming evil.

## Columbium.

Mr. J. L. Smith, of Louisville, says *Nature*, has examined several species of mineral containing columbium, and claims the restoration of this name for the metal instead of that of niobium, generally given to it in England and on the Continent. His reason for making this reclamation is that the name niobie acid was incorrectly given by H. Rose to one of the acids found by him in his researches on the columbite of Bodenmais, and subsequently proved by him to be identical with the columbic acid originally discovered by Hatchett in 1801. The name niobie acid, however, given by Rose, has never been altered, and Mr. Smith thinks the original columbic acid should have been retained. In remarks on the chemical constitution of the minerals described by him, Mr. Smith thinks that the composition of the columbates, although appearing at first sight complex and irregular, becomes much simpler when due allowance is made for the intermixture of the different varieties with each other. Columbite, the best known of the minerals, can be well recognized as a simple columbate of iron and manganese; microlite appears to be a columbate of lime; pyrochlore, a columbate of the cerium oxides and lime, but whether or not a neutral columbate remains to be investigated. Hatchettite he considers as a neutral columbate of niobium and lime, and samarskite a basic columbate of iron, niobium and yttrium oxides. Yttracolumbite and euxenite are basic columbates of yttrium and niobium, the first being anhydrous when pure, the second containing water. Fergussonite is a hydrated basic columbate of yttria, and rogersite a columbate still more basic. In arranging a general view of these minerals, Mr. Smith does not take into account the constituents which exist in small quantities only.

THE COSSACKS AND SCIENCE.—An English writer shows how the Cossacks may apply science in the present war, as follows: "In a belt around their waists they carry a few pounds of gun cotton or dynamite, and with this highly destructive explosive they may work incalculable harm. A small charge of gun cotton placed simply upon rails and fired with a fuse suffices to blow several feet of the iron to a distance of many yards, thus rendering the railway unserviceable on the instant. A trooper may dismount, place a charge at the base of a telegraph pole, fire it, and be in his saddle again within 60 seconds. Wires may thus be cut and communication stopped in the heart of an enemy's country by fearless riders, while the lines of railway are entirely at their mercy. Even light bridges and well built stockades may be thrown down by the violent detonation of compressed gun cotton, and forest roads considerably obstructed by trees thrown across, which are never so rapidly felled as when a small charge of this explosive is fired at their roots."

MAKING SPEECH VISIBLE.—At a meeting held at Salem, Mass., a lecture on "Visible Speech" was delivered by Prof. Graham Bell, who, by means of the drum in a human ear cut from a dead subject, has succeeded in producing a phonograph. The ear is placed in the end of an ordinary speaking trumpet; on speaking into the trumpet the drum is set in motion; this moves the style; the style traces the effect on a plate of smoked glass; and by means of a camera the curves and lines can be exhibited to a large number of spectators. The five vowels make five different curves; and, according to Mr. Bell, there is no such thing as a sound or tone pure and simple, but each is a composite of a number of tones; and the wavelets by which these are produced can also be shown on a screen. Tables of the various symbols have been drawn up, and found useful for educational purposes, as was demonstrated by a young deaf and dumb pupil from the Boston institution, who interpreted the symbols at sight.

AGE OF SUN AND STARS.—Prof. Kirkwood closes a communication upon this subject to the American Philosophical Society with the following summary of his conclusions: 1. The history of the solar system is comprised within twenty or thirty millions of years. 2. From the fact that the larger component of Alpha Centauri radiates twice as much light as the sun, while the mass of the former is less than that of the latter, we infer the probability that our solar system is the more advanced in its physical history. 3. 61 Cygni seems to have reached a greater degree of condensation than the sun, since, on the hypothesis of equal destiny, the surface of the larger member is one-third that of the sun, while the intrinsic light is less than one-ninth. 4. The companion of Sirius appears to have reached a stage of greater maturity than the sun, while the contrary seems to be true in regard to the principal star.

NEW SPONGES.—No less than five new varieties of sponges were discovered by Dr. Meyer, at the Philippine Islands and New Guinea, during his recent travels in the Eastern archipelago.

COMING.—Two French astronomers, M. Andre and M. Angot, will visit California, next year, to observe the transit of Mercury, which occurs on May 6th.



# Pacific Board—Latest Sales.

WE'NSDAY, A. M., Aug. 8,	7400 Con Imperial.....	.83
80 Albuha.....	104 @10	10
385 Best & Belcher.....	153 @10	15
470 Bullion.....	71 @7	7
100 Belcher.....	31	
200 City of Boston.....	63	
350 California.....	27 @7	27
3 Chollar.....	28	
350 Caladonia.....	3.70 @3	3
620 Con Imperial.....	84 @85	84
75 Con Virginia.....	29 @29	29
90 Crown Point.....	5	
275 Exchequer.....	61 @6	61
530 Gould & Curry.....	8	
945 Hale & Nor.....	4.57 @4	4
75 Herald.....	1.50	
40 Julia.....	13	
500 Justice.....	91 @91	91
100 Lady Bryan.....	95	
400 Leviathan.....	45	
160 Mexican.....	91	
350 New York.....	10	
110 Ophir.....	14	
60 Overman.....	20 @20	20
110 Silver.....	61 @6	61
110 Sierra Nevada.....	4	
200 Old Silver.....	13	
200 Trenton.....	3	
50 Union Con.....	3	
25 Yellow Jacket.....	3	
AFTERNOON SESSION.		
535 Best & Belcher.....	153 @16	153
35 Belcher.....	3.30	
650 Bullion.....	71 @7	71
WEDNESDAY, A. M., Aug. 9,	1700 Con Imperial.....	.83
1750 Coso Con.....	10	
25 Crown Point.....	5	
50 Caladonia.....	3.9	
30 Con Virginia.....	30 @29	30
300 City of Boston.....	63	
30 Eureka Con.....	6	
60 Exchequer.....	60	
890 Gould & Curry.....	81 @8	81
100 Gold Bar.....	50	
300 Hale & Nor.....	4.60 @4	4
20 Herald.....	15	
875 Hussey.....	29 @30	29
160 Justice.....	91 @91	91
100 Lady Bryan.....	95	
500 Leeds.....	10	
580 Leopard.....	14	
140 Mexican.....	99 @99	99
1475 Modoc.....	95	
50 Meadow Valley.....	60 @55	60
10 Manhattan.....	17	
350 Minni-ta Belle.....	11 @11	11
260 New Coso.....	10	
100 New York.....	13	
75 North Star Belle.....	18	
100 Ophir.....	20 @20	20
25 Phoenix.....	3	
200 Poorman.....	10	
770 Panther.....	90 @95	90
330 Raymond.....	Ely 13 @14	13
100 San Francisco.....	10	
100 Savage.....	10	
150 Trojan.....	55 @60	55
CALIFORNIA BOARD—LATEST SALES.		
WE'NSDAY, A. M., Aug. 8,	AFTERNOON SESSION.	
300 Andes.....	30 Alpha.....	10
175 Best & Belcher.....	60 Bullion.....	7
50 Bullion.....	70 Best & Belcher.....	15
535 Caladonia.....	30 Belmont.....	31
350 California.....	160 Canadonia.....	35 @35
400 Con Imperial.....	30 California.....	27
80 Con Virginia.....	330 Con Imperial.....	83 @83
000 Coso Con.....	85 Crown Point.....	4.00
50 Crown Point.....	30 Con Virginia.....	29
50 Exchequer.....	11550 Coso Con.....	10
250 Gould & Curry.....	50 De Pres.....	55
115 Hussey.....	130 Gould & Curry.....	81 @8
120 Hale & Norcross.....	105 Halsey.....	30 @29
100 Justice.....	100 Hale & Nor.....	4.60
140 Julia.....	115 Justice.....	1
350 Lady Bryan.....	10 Julia.....	1
400 Leviathan.....	50 Leopard.....	14
65 Mexican.....	150 Meadow Valley.....	95
10 Modoc.....	70 Mexican.....	9
40 New York.....	100 Modoc.....	10
40 Ophir.....	150 New York.....	27 @27
60 Overman.....	80 Overman.....	20 @20
400 Poorman.....	100 Ophir.....	14 @14
175 Savage Barcelona.....	200 Poorman.....	11 @9
200 North Carcon.....	200 Rock.....	35 @35
90 Sierra Nevada.....	225 Stepote Con.....	3
100 Trojan.....	75 Savage.....	6
200 Trenton.....	190 Sierra Nevada.....	41 @42
60 Yellow Jacket.....	2725 South Caladonia.....	25 @25



## MINING SUMMARY.

The following is mostly condensed from journals published in the interior, in proximity to the mines mentioned.

## California.

## AMADOR.

**LIVE OAK.**—Amador Ledger, July 4: The workmen are taking out a fair quality of ore from this mine. The ledge is increasing in size as the drift advances. Operations are being pushed along steadily, and the owners are strong in the belief that they have a good paying property.

**FROM SETTER CREEK.**—Mr. John Tucker, an old resident of this vicinity, has been prospecting for gold in the hill back of the Mahoney mine, for some time. Last Saturday he struck a very rich vein—to every appearance a "pay streak." A specimen of quartz about the size of a cobble stone was thickly covered with gold. The shaft is down 50 feet and the vein is from five to six feet thick. The indications are good that it will hold out. Messrs. Tibbitts & Tucker are the owners.

**RIEN ROCK.**—Amador Dispatch, July 4: The water has just been turned out of the mine, and the surface is a rich rock, and remarkably rich rock discovered in the 800-ft level. The ledge is about six feet thick, and it is thought that the rock will average \$50 per ton. The owners are enjoying the highest state of jubilation.

## BUTTE.

**GOLD BRICK.**—Oroville Mercury, Aug. 5: Elsewhere in this issue we give an item referring to the fact that the Spring Valley Co. brought down an \$18,000 bar of gold. On Wednesday of this week, we saw on the counter of Lideout, South & Co.'s bank, a splendid looking bar that has since been taken out, that was worth \$33,000, making \$51,000 that has been cleaned up inside of a week. We hear the end is not yet.

**SECTION MACHINE.**—While at Oroville on Saturday, we took a look at the great suction machine, then at work immediately above the bridge which spans Feather river. As we were not permitted to go aboard the boat that contained the machine, we cannot give our readers a very accurate description of its workings. This we may say with truth, though quite of its character, is a very wonderful piece of mechanism and performs its work well. A company of Oroville gentlemen are constructing a machine on the same principle as the one now in operation, for the purpose of working the bed of Feather river just above the dam of the old Cape claims that paid so enormously twenty years ago. The new machine will be five times as large as the one now at work, and will be worked with an engine of forty-horse power.

## CALAVERAS.

**GRAVEL MINE SALE.**—Stockton Independent, Aug. 4: Two Italian miners, who owned a gravel claim called the Garibaldi, three miles north of Alta Vista, Calaveras county, recently sold out for \$40,000, and with their families left for their native land, where they will reside in affluence the balance of their days. We happened to be on the stage that brought them from Alta Vista to Milton. They were of the lower class of peasantry, without refinement or education, and fully calculated to enjoy the luxuries which such fortune and it is possible for them to possess. We could not but wonder at the freaks of the fickle goddess in the bestowal of her gifts.

**UPPER COUNTRY FRESNO.**—Calaveras Chronicle, Aug. 4: At West Point, mining operations are being carried forward with usual briskness. At the Champion, both sinking and stopping are being vigorously pushed. The shaft has reached a depth of about 340 feet, the ledge showing as well as at any other place. In fact, the Champion is sustaining its well earned reputation of being the "boss" mine of the upper country. The Hall or Zaccaro mine is now running on rock from the Doyle mine. The Zaccaro is being constantly worked with cheering results. The tunnel in the Lacey mine is completed, and the work of taking out ore is to be commenced immediately. New and powerful works are being erected at the Lacey mine, the property of the Enterprise consolidated company. The mine is looking splendidly. At Railroad, the Chapman mine is being systematically worked. The new pump lately put in the shaft keeps the mine free of water, and operations are going ahead briskly. A fine ore body has been uncovered in the levels. The work of re-erecting the hoisting works on the Sander mine, lately destroyed by fire, has been commenced. At Mequito, mining affairs have suddenly taken an impetus. Work has recently been resumed on the well-known San Bruno mine, and operations have also been recommenced at the Vance. Both mines are now in the hands of a substantial company. In the Potter & Rodgers mine a 7-foot vein of fine ore has been developed. Work is progressing favorably at all points.

## EL DORADO.

**COMPLETED.**—El Dorado Republican: Warren Bros. & Co., on their river claim above Chili Bar bridge, have completed their dam and flume, and the water has been running through the flume all the week, and they have probably commenced sinking to the bottom of the channel here. The break in the big ditch last week caused the river to rise to such an extent as to test their flume to its fullest capacity. There are now several Chinese camps in their vicinity using the rocker.

A SLATE quarry has been opened near Kelsey, and the first load of the product was brought to this city yesterday, in the shape of a fair article of roofing slate. It is not as smooth as we have seen, but is exceedingly tough.

**CHURCH-UNION.**—Cor. Mountain Democrat: The mines in this vicinity are all paying well, and are being worked by able and moneyed men. The Church-Union mine, a short distance from town, under the superintendency of Mr. Poundstone, is paying very well. The rock taken out in the last 12 days run yielded \$25 to the ton. Water being scarce, the Superintendent was unable to procure enough to run both the hoisting works and the mill, consequently the latter has been shut down for a few days; but work will soon be resumed, preparing to run the hoisting works by steam. The mine gives employment to about 40 men.

Work at the well-known Pocahontas has been resumed. Last week they struck a ledge of good paying ore, which it is to be hoped will hold out.

The Cook mine is also paying well. It is being worked by a force of men under Capt. Staples.

The Star mine, owned by the Condo Bros., is being worked with great success. Last week was taken out quite a quantity of very rich ore. \$1,000 was pounded out of the rock in a mortar, besides 60 tons of rock said to be worth \$50 a ton.

A NEWLY discovered mine, about three miles southeast of town, is creating considerable excitement among mining men. One hundred tons of rock have been taken out, which was found to be very rich. The mine is worked by Harding & Gignac. There is considerable talk of putting up a mill on the ground.

**INVO.**

**THE CROOKS.**—Inyo Independent, Aug. 4: The Rex Montis brought down four bars of fine bullion to-day, but it is understood that future operations may be retarded for a time on account of a dispute regarding the mill property. The production at the Eclipse was fully as large as anticipated; in fact, the run just completed was by far the best ever made in the mill, but we are not in possession of the exact figures.

**ACORN BAR OR BURR.**—Coso Mining News, Aug. 4: Peter Taylor, Superintendent of the Emigrant mines at Lee district, came in last Saturday, bringing with him another bar of silver bullion from the above company's mines, weighing 33 pounds, which he shipped to San Francisco. Mr. Taylor says that his bullion contains only a percentage of gold, making the bullion much more valuable. Everything in and about the mines and mill is working finely. Since the foregoing was put in type, another bar of Emigrant bullion was sent in from their mill, weighing 70 pounds, and shipped yesterday.

**MARIETTA BULLION.**—W. E. Brown, Superintendent of the Marietta company's mine, at Lookout, came in the fore part of the week, bringing with him, for shipment to San Francisco, four bars of bullion, weighing 332 pounds.

## NEVADA.

**BEAUFORT BAR OF GOLD.**—Nevada Transcript, Aug. 4: We saw yesterday a beautiful bar of gold, which came from the Independence mine, formerly known as the Murchie quartz ledge. The gold weighed 23½ ounces, and was valued at \$375, which was an average of \$75 per ton. This is exclusive of the sulphurets, which are very rich. The ledge at the Independence mine is increasing in thickness, and yet holds its own as regards richness. The owners feel considerably elated at the result of this last week's work, and the work of opening up the mine on a more extensive scale will be the result. The Independence promises to make a steady paying quartz mine.

**COPPER MINES.**—The copper mines at Spenceville, and its vicinity, are beginning to look up again. One ledge there is about 120 feet wide, and is now being worked under the superintendency of G. E. Dietkin. A gentleman who was down there a few days ago, informs us that he witnessed some of the ore being put through by a machine he had never seen before. He describes it as follows: The ore is placed in large piles and is set on fire, and there is sufficient sulphur in the ore to keep the fire alive. After it has been thoroughly burned the fire is extinguished by means of a hose, and all the debris is washed off. After the debris is washed off, it is placed in revolving pans, and in the pans there are large pieces of iron like the ones which most of the sulphur that has remained in the ore. After going through this process, it is shipped to San Francisco. The cost of getting it out is \$1.25 per ton, and about \$4 to land it in San Francisco. Several lots which the company have shipped paid about \$20 per ton.

**STILL PASSING OUT.**—Wm. Watt, Superintendent of the Eureka mine, yesterday shipped \$14,500 to San Francisco, the result of the Eureka's clean-up for the past week or ten days. The "old Ajax" has performed wonders in the way of bullion.

**GRASS VALLEY NEW M. Co.**—Grass Valley Union, Aug. 4: The mine owned by this company is looking well. The ledge in shaft is about three feet in thickness and contains heavy sulphurets in abundance, while free gold is visible. The ore is very much like that of the Eureka and Idaho mines, and many think the Grass Valley New is on the regular Eureka ledge. The New is nearly directly west of the Eureka, and the ledge runs east and west. The name of "Ginlet," which the miners facetiously bestowed on the Grass Valley New mine, will have to be changed, for the present appearance argues well for big and rich ledge. The stock of the company is owned in Grass Valley, and the stockholders are nearly all working miners.

**DISCOVERY OF CINNABAR.**—W. G. Schofield, who is an experienced miner, has discovered a cinnabar ledge, about seven miles from Grass Valley, in the direction of Colfax. The ledge is reported to be from 75 to 80 feet in thickness, and Mr. Schofield thinks it will give 25% of quicksilver. He went to San Francisco yesterday morning, where he will order a furnace. In the course of a month or six weeks the furnace will be in operation. Mr. Schofield will be able, he thinks, to sell Nevada county quicksilver to the miners here at San Francisco prices, thus saving freights. In a few weeks we will know more about the matter and will then give more particulars.

**OAKLAND.**—Foothill Tidings, Aug. 4: The Oakland company, whose mine is on Wolf creek, near the Home-ward Bound, has its wheel and building well under way, and expects to be hoisting and pumping by machinery in about 10 days. We understand the prospects of the company are good.

## PLACER.

**A SUCCESS.**—Placer Herald, Aug. 4: We spoke a few weeks ago of the Verry Bros. opening a quartz ledge a short distance this side of the Greene mine. Further developments go to show that they have a good mine. They have now some 60 tons of milling ore on the dump, which is worth about \$40 a ton, a yield that is very good in any country.

**J. R. ROBINSON.** Superintendent of the Gold Bar mine, located on the American river, a few miles above Auburn, informs us that they are now down to the gravel and that their prospects are altogether encouraging. This company are going under the river channel for the treasures that lie beneath, and the prospects are that their enterprise will prove a fine success.

**IOWA HILL TREASURES.**—Placer Argus, Aug. 4: Mr. Witherspoon has bought Streeter's interest in the Centennial company's claim. The prospects in the canyon below are considered good. It has not been worked for the past eight months. At the Chimney Rock claim, at Green valley, a mine 340 feet long, besides bull-wheels, pumps, and quicksilver, has been discovered. The works are very fine. A pit, 60 feet long and 40 feet wide, has been dug down 12 feet. In eight feet more they expect to strike the bedrock and take out good pay. C. H. Wilcox is foreman. There are only 12 men employed as yet. At Joe Norry's claim, also in Green valley, a tunnel has been run in 250 feet, and a channel struck that pays about \$3 per day. Last week a few \$12 chunks were taken out. Norry has a three-stamp mill and crusher of his own. Williams has opened an old claim and expects to be rewarded for his labor. George Opal has run a deep cut of 15 feet about 160 feet into the main channel. Joe Ross, on Hayden hill, is running cuts, preparing for winter. The Rough and Ready claim, on Grizzly Flat, has been bought by the owners of the Hidden Treasure, who propose to work in the tunnel. They are going to put on an engine and sink a slope. It was surveyed last week.

## TRINITY.

**FROM NEW RIVER.**—Trinity Journal, Aug. 4: Moses Patterson came into town Tuesday from the New River country. He reports a large number of men in this section at the present time, and prospecting going on lively. New diggings, with coarse gold, have been struck in the Devil's canyon, by Bowler, Jewett and "The Chicken," from which pieces weighing as high as \$16 have been taken. Patterson went over to pay out a piece or two to bring into town as a sample, but did not find any "chipsas," though he found a few large ones.

**BULLYCHOPE.** Mr. Gupill informs us that the Bullychope ledge is turning out well as the miners progress downward. They have now a well-defined ledge of paying quartz, four feet in thickness.

**SUIT DOWN.**—Hon. W. J. Timin returned this week from Cinnabar, where he has been superintending the work done by the Trinity Q. M. Co. From Mr. Timin we learn that there is little done in the Cinnabar mines at the present time. The water has run very low, putting a stop to sluicing operations, and when the Altona finishes cleaning up its present run it will probably shut down work and employ but few hands.

**MORE QUARTZ.**—N. M. Barnett has discovered another quartz ledge, which prospects well. The new discovery will make the mine a large one, and the ledge is about a mile distant from that place. The existence of such a ledge has been surmised for some time, and parties have prospected considerably for it.

**GOOD PAY.**—Geo. E. Sargent is one of the lucky discoverers on Deadwood, and his ledge is yielding something like \$100 per ton. He returns. He crushes some of the rock in a large mortar, and the result of 12 days' work averaged \$38.38 per day.

**RICH QUARTZ.**—A splendid prospect was obtained by Mr. Paulsen from a piece of Deadwood quartz. The piece did not show any free gold, but when pounded up yielded very richly. Another piece from H. E. Willey's claim exhibited a fine showing of gold, and the naked eye, excellent. One of the owners, John Shedd, says that the Poor Man's quartz mill, consigned to Henry Jenkins, and intended for use in crushing the quartz from the Engel ledge, on East Fork. The mill has two stamps and is calculated to run by hand or water power. The mill was set up this morning and is being tested.

**A GOOD PROSPECT.**—Two rollers showed us a fine lot of gold obtained from Deadwood quartz. The weight of the rock pounded up was nine ounces, part taken from H. E. Willey's ledge and part from another ledge. The

nine ounces of rock yielded \$1.50 in gold, or over 16 cents per ounce.

## Nevada.

## WASHOE DISTRICT.

**SIERRA NEVADA.**—Gold Hill News, Aug. 8: The north drift on the 1250-ft level, running to connect with the Utah, is making good progress, the face still in very favorable ground. It will probably take 90 days yet to complete the connection. The south drift on the 1450-ft level is also being pushed rapidly forward to connect with a corresponding north drift from the Mexican. This connection will probably be completed inside of 60 days.

**UNION CO.**—The north and east drifts on the 1300-ft level are each being steadily and energetically advanced without change of interest to report. Wm. Hardy, the present able Superintendent of the Imperial Co. mine, received, yesterday, his appointment as Superintendent, vice Capt. Samuel T. Curtis, removed; and W. A. Longene as foreman. Both gentlemen are well versed in mining operations, and there is no longer a doubt of the honest management and development of the mine.

**GOLD & CURRY.**—Sinking the main incline is making the usual fair progress, the rock in the bottom being still of a hard blasting nature. The main east cross-cut (No. 1) on the 1750-ft level has been started up and is making good progress. Cross-cut No. 2, from the south drift on the same level, is also being pushed steadily and vigorously forward, the face in very favorable vein matter.

**MEXICAN.**—The north drift on the 1405-ft level, running to connect with the Sierra Nevada mine, is being pushed energetically ahead, the face in very favorable ground. The north drift on the 1600-ft level shows no change.

**OVERMAN.**—An east cross-cut has been started on the 1150-ft level, about 550 feet south of the shaft, the face of which is in the favorable character of quartz. The south drift on the 1300-ft level is being pushed vigorously forward, with highly encouraging prospects.

**BELLION.**—Work on the 1000 and 1700-ft levels, and in sinking the main incline, has been suspended for a few days in order to retimber and repair a portion of the main shaft that has been needing it very much for some time.

**COX VIRGINIA.**—Daily yield, 500 tons of ore, keeping the mills all crushing to their full capacities. The bullion production for the month of July will reach something over \$1,000,000. The regular dividend of \$2 per share was declared yesterday, aggregating \$1,000,000. The ore-producing slopes from the 1650 up to the 1400-ft level are looking well and yielding good ore at every point.

**GOLD & CURRY.** The ore slopes south, on the 1300-ft level, are also being opened up preparatory to the rapid extraction of ore when the repairs to the main shaft are completed. The upraise from the 1500 to the 1400-ft level has been completed, having passed the entire distance upward through splendid ore. The double winze below the 1650-ft level is being sunk at a fair rate of speed, the bottom still in ore. The water in the winze is gradually lessening. The west drift on the 1750-ft level from the C. & C. shaft is making splendid progress, advancing at the rate of 50 feet per week.

**CALIFORNIA.**—Daily yield, 550 tons of ore. The ore slopes are splendidly developed portions of the mine. The mills are all running at their full capacity, and the future prospects of dividends for long months to come were never more glowing than now. The regular monthly dividend of \$1,050,000 was declared yesterday, and the yield of bullion for the month of July will not fall much short of \$1,500,000. The winze recently started in the ore body 20 feet north and 20 feet west of winze No. 8 is being pushed steadily forward, toward the 1600-ft level, in the richest character of ore. The ore body going south, between winze No. 5 and winze No. 6 on the 1600-ft level, is growing wider and is still of the same rich quality. Repairing the deep winze near the northern boundary line is going steadily ahead. The south drift on the 1840-ft level is steadily advancing in the west country rock. To-day a branch drift from the west drift on the C. & C. shaft, on the 1750-ft level, was started to run in a westerly course so as to intercept and connect with winze No. 3 below the 1650-ft level.

**YELLOW JACKET.**—At the 2300-ft level a prospect hole is being bored east from the main south drift, opposite the west cross-cut. It is in a distance of 240 feet, and over half that distance has been bored in quartz which is well filled with iron sulphurets, giving low assays in gold, but silver value is the only thing done on this level for the past five days, but drifting is to be resumed to-morrow, north and south. The heavy masonry foundations for the hoisting engines are completed, and the machinery is being brought down from the side-track and placed in working position as fast as its ponderous nature will admit.

**JUSTICE.**—Daily yield, 300 to 350 tons of ore. The decrease in the yield of ore is entirely owing to the Carson river mills being unable to crush the usual amount of ore on account of the very low stage of water. The ore slopes on all the levels, from the 500 down to the 800-ft level, are looking finely and have a large amount of ore yet in sight ready for extraction. The main east drift on the 1150-ft level is being steadily advanced, the face in soft porphyry mixed with streaks of clay and quartz.

**LADY BRAX.**—Four car loads of the hoisting machinery have arrived at the railroad depot in Virginia, and is being shipped to the mine as rapidly as it can be loaded on the wagons. It will be remembered that at the time the mine was closed down a month or two since, the new and powerful pumping machinery was all in place, just ready for use, and the hoisting machinery was all in place, just ready and inclosed; that the gallow's frame was up, and, in fact, everything in and about the mine was, after a long struggle, just approaching a condition paramount with the real intrinsic merits of the mine. The financial troubles of the company have all been settled, and they will, in a very short time, be in a splendid condition to commence work.

**OMIR.**—Both the north and south drifts on the 1000-ft level are making the best progress. The east drift from the bottom of the shaft, on the 1700-ft level, is making fair headway, with some favorable ore prospects. Sinking the double winze on the Mexican line below the 1700-ft level is making fair headway. Wm. Hardy, the temporary Superintendent, yesterday received his appointment as the permanent Superintendent, and telegraphed his acceptance of the same.

**DEER & BELCHER.** East cross-cut No. 3 on the 1700-ft level is making steady progress, the face in soft porphyry, with a continued and heavy flow of water.

**SAVAGE.**—The small donkey pumps used to supply the larger pumps and drain the water at the bottom, having given out, are being replaced with a splendid Cameron pump of the largest size. This will be ready for operation in a day or two more. A Root blower has been placed on the 1600-ft level to supply air to the men at work in the shaft.

**IMPERIAL CO.**—Sinking the south winze below the 2200-ft level is going steadily ahead, the streaks of quartz in the bottom continuing of a fair character.

**UTAH.**—Sinking the main incline shaft below the 1150-ft level is making the best progress, the bottom still in very favorable ground. The north drift from the Mexican, at the east drift at the 1150-ft station has just been started.

**HALE & NORCROSS.**—The pumps are kept steadily running at the top of their speed, and have gradually reduced the water to a point a few feet below the 1000-ft level.

**LEVIATHAN.**—The north cross-cut at the 600-ft level is making good headway, and the whole face at present is in containing several fine streaks of high-grade ore.

**BELCHER.**—Sinking the air and drain shaft is going steadily forward without change or interruption.

**CALEDONIA.**—The northwest drift on the 1600-ft level has been cutting some very fine quartz, with every indication of an ore body, not far below for several days past. However, sinking the main shaft is making the best of progress, the entire bottom being in vein matter that is steadily improving in character as a greater depth

is attained. The formation in the bottom for the past two days has been clay and decomposed quartz mixed with gypsum, and is easily worked.

**SUCOR.**—Sinking the main shaft is being pushed ahead with all the energy possible, the bottom being in very hard blasting rock.

**CUILLAR-PORTER.** Daily yield, 90 tons of ore. The east drift on the 1750-ft level is being pushed ahead with the usual vigor.

**ALTA.**—The west drift from the 1050-ft station is steadily advancing, the rock in the face gradually softening and showing evident signs of a near approach to the level.

**CROWN POINT.** The south drift on the 2000-ft level, running to connect with the Belcher air and drain shaft, is making steady progress.

**SUBTUNNEL.** Total length of tunnel, 17,715 feet. During the past week the rock encountered has been very hard, but has worked advantageously, allowing of unusually good progress.

**SILVER HILL.** The new pump-hoist is finished and on its way from San Francisco.

## CHERRY CREEK DISTRICT.

**NEW MILL.**—White Pine News, Aug. 5: John Howell, an old-time millman of Eastern Nevada, and particularly identified with Austin ore in years past, is to have charge of the erection and management of the Star company's mill about to be constructed at Cherry Creek in this county. The mill is to be built under contract by the Pacific Iron Works of San Francisco. New hoisting works are already on the ground and in course of construction. Chas. Keeney, the former Superintendent, is now in charge again. Cherry Creek has put on a look of business again.

## ELY DISTRICT.

**RAYMOND & ELY.**—Pioche Record, Aug. 4: The ore bodies in the upper levels are looking much better than usual and are yielding well, with a better character of ore. The ledge on the 1200-ft level remains about the same, no change of note having occurred since our last report. The mill is still running on tailings; ore being allowed to accumulate on the dump, about 300 tons now being on hand. Pay-day for both the mine and mill will be on Monday next, the 6th inst.

**ALPS M. Co.**—The Chicago mill has been running constantly on ore during the past week. The prospect in the mines is even better than at last report. The Superintendent reports that the development in the winze on the 900-ft level of the Mazappa mine, referred to last week, is improving. A fine vein of free milling ore has been discovered in the upraise from the 4th level of the Washington Creole mine.

**BELLEVILLE FURNACE.** The furnace at Bullionville closed down on the 1st inst., after a two weeks' run. It will be about a week yet before it starts again. Want of coal was the cause of stopping.

**RESIGNED.**—A. J. Blair, Superintendent of the Alps M. Co., has been obliged to resign the position on account of ill health. Theodore Hale has been appointed Superintendent, and took charge Monday last.

## MARIETTA DISTRICT.

**ENDOWMENT.**—Gold Hill News, Aug. 6: The Endowment mine, which is situated in Marietta district, about 10 miles from Belleville, is owned by Dr. Webber and others of Virginia City. Ascertaining its actual value, they secured possession by purchase, and went to work to practically develop their new source of wealth. Since the incorporation of the mine in May they have started a five-stamp mill to crushing the ore, with most gratifying success, the first seven days' run yielding bullion to the value of \$5,000. The yield for the past month exceeded \$15,000, and double that is expected this present month. The mill has five stamps and two Stewarts pans, being the same neat little mill that represented the State of Nevada at the great Centennial exposition. The shaft is down 180 feet, and the vein is about three and one-half feet wide. The ore averages about \$100 to the ton. Regular bullion shipments are coming from the mine by the way of Carson.

## TYBO DISTRICT.

**CLOSED DOWN.**—Pioche Record, Aug. 4: About a dozen persons arrived in Pioche from Tybo on Tuesday last, and more will leave there shortly for other points. Owing to the fact that the company having charge of the Tybo mine was obliged to close down except one; that one is running, but will not continue to run long. This places business for the present at Tybo at a standstill, and there is no telling when the furnaces will start again.

## WHITE PINE DISTRICT.

**TO RESUME OPERATIONS.**—White Pine News, Aug. 4: The Henry tunnel (designed to pierce Treasure Hill) upon which work has been suspended for several months, is to resume operations immediately. Mr. Montgomery, the well-known mechanic, has received orders from the East to put the machinery in working order, preparatory to starting up at once. We are not able to state positively whether Major Henry is to be the Superintendent or not.

## Arizona.

**LUKE'S MILL.**—Arizona Miner, July 27: The owners of Luke's mill, in Bradshaw, after testing their mill and finding it complete in everything except a roaster, have sent Mr. Donahue, having seen the mill in San Francisco and order it. The ore contains sulphurets, and cannot be worked successfully without first being roasted. Therefore they have concluded to add this necessary article before starting in for good; in the meantime ore will be taken out and other improvements made just the same as if the mill were running. Water is also scarce and rain necessary to furnish sufficient for mill purposes. The two-stamp mill has been purchased for the Pima mines. They are cheap, and every mine owner should possess one of these little mills, whereby they might be able to develop their valuable mines, and thus line their pockets with the needful.

**MR. DARROCHE** has been on a flying trip to the Peck, Humburg and Bradshaw districts, and reports very favorable for the mines. He informs us that the Peck, Bradshaw, McFee and Gillespie have struck a very rich lead in Humburg district, that assays into the thousands per ton.

**THE TIGER TO BE WORKED.**—We were shown a telegram this morning from J. H. Helm, who has bonded the Tiger mine for six months. Mr. Helm is in San Francisco, and telegraphs Bowers & Richards that he will ship his hoisting works of Saturday next. Mr. Helm has taken the mine for six months, and is to do \$10,000 worth of work on it, and when the time is up is either to take the mine and pay two dollars per share for the incorporated stock, or to deliver it over to the owners, together with all the ore he shall have taken out.

**THE ISABELLA.**—Another big find on the Humburg has come in light, showing interest on the surface for as far as the claims of 1,500 feet each have been located by A. J. McPhee, Geo. S. Demint, Wm. Gillespie and J. R. Darroche. The mine is situated half a mile northwest from the Resene, and one mile from the Swilling mine, and was discovered three weeks ago. They have a shaft down 15 feet, showing a ledge from three to four feet in thickness, and a pay streak fully 1½ inches wide. From the ledge the samples were taken with a view to ascertaining the average value of the rock that the owners adjudged to be shipping ore. These were brought to town yesterday by Col. H. A. Bigelow and George S. Demint, and this morning assayed by F. W. Blake, with the following result: \$1,431.35, \$1,792.34, \$2,624.91, \$1,659.76, \$313.79, \$450.80, making an average of \$1,378.52 per ton. A specimen of the ore, weighing 500 lbs., was taken from the shaft was also assayed, which went \$72.25. This certainly shows a splendid prospect.

**GLOBE DISTRICT.**—Arizona Enterprise, July 28: The health of the miners generally is good, notwithstanding the fact that the weather is hot and dry. The thermometer, at present writing, stands 105° in the shade. There have been few light sprinkles of rain, but not enough to lay the dust. Notwithstanding the bad times and dry weather, the miners generally seem cheerful and are

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sons is to go to Truckee on the C. P. R. R., then take Webber's stage, which leaves Truckee Tuesdays, Thursdays and Saturdays of each week during the season. This route enters Webber valley from the east, and affords a view of the canyon and cataract described.

The principal approach is from the west, via the west gate of the Hennessy pass, connecting with Eureka, Nevada City, Grass valley and the narrow gauge to Colfax on the main railroad. This route is longer and much more expensive, unless visitors come, as many do, with their own conveyances. Families from that section move up here with their household goods and camp in the groves or occupy the cottages provided for season tourists. Besides these main entrances, the north and south passes admit equestrians as described.

Webber Lake in Winter.

About November 1st Webber lake is deserted alike by visitor and proprietor; one man being left in care of the property, to prevent the snow from breaking roofs, and, mayhap, to succor an occasional traveler crossing the Sierra on snow-shoes, or wending his way up to Meadow lake, where one or two families remain during the winter.

It has been the privilege of the writer to spend two winters at Webber's hotel, spreading his plants and other objects of natural history on the dining tables, and studying them at will for six months in the year, in no one's way and eight miles from a human soul. He has enjoyed some of the best weeks of his traveling life, and for there are about thirty such weeks usually, as in other places of such high altitude, the fierceness and power of the winds are simply terrible.

Snow often falls three or four feet in a night and six or seven small feet were once recorded between nine at night and sunrise. The wind piles it up in a beautiful shining Sierra along the north shore of the lake, its glittering pinnacles 15 to 30 feet high in front of the buildings. The lake will often remain open until late, a peculiarity of California climate. Tahoe lake, at the same elevation, being a vastly larger body, never freezes. The ice-covering of Webber, seemingly very good skating at times, is really always treacherous, crumbling to crystals to-day where it was solid yesterday. As the ice advances and retreats, and snow clogs the outlet, water rises over the ice and, freezing nightly, soon a covering of three or four feet is formed, over which old Boreas finds no impediment to his night work of Sierra-making.

The outlet pours a full stream over the cataract now, and presents a new creation. The rising mist congeals, and forms an immensè oval apron, covering the upper half of the plunging torrent, ornamented on each side by white fluted columns of ice supporting the sides of the apron. The ice being, as stated, so brittle, is often broken up in the stream above and its huge blocks hurled by the current down the cataract, thundering against the resounding apron in front and the jutting rocks in rear, send a roar of sound reverberating down the gorge that is truly sublime.

The four passes are packed deeply with snow and the groves so beautiful and animated in summer are dreary, snow-filled masses of tree tops, tracked only by the mouse-hunting otter, fox or coyote, and, on sunny days toward spring, by the prowling grizzly.

What a change of sounds, too! Instead of the song of gay revelers awaking the echoes of the forest from their boats in the center of the lake, the rattle of passing vehicles, the shout of boys scampering their steeds over the clean gravel, or even the chirp of birds and hum of insects—all is deepest silence, save at times the humanlike shriek of the cracking ice, or the angry, fitful howl of the wind in the bending pines. Only occasionally a daring spirit, skilled in the use of snow-shoes, ventures upon the ice to carry the mail to the hermit, and to catch a trout through the ice for the capricious taste of an invalid—the wholesale fishing of trout in winter, their spawning season, being justly prohibited by law. Only the glorious sun is a reliable visitor, and he timidly peers over the mountain peaks but a few hours daily, when the rolling clouds permit.

Before closing this brief description of Webber lake and its attractions, with a short biography of its worthy proprietor, the writer desires to make a personal statement. He has no interest whatever in the popularity of Webber lake, his home being in Sierra valley, 10 miles away—or rather, anywhere from end to end of the high Sierra—and he is writing these words entirely without the knowledge of good Dr. Webber. He describes these scenes as he has those of other popular resorts in California, because they are worthy of description and he would aid tourists and invalids in enjoying their paramount benefits.

Biography of "Good Dr. Webber."

Dr. David Gould Webber was born September 12th, 1809, in Livingston county, New York, of Scotch and Irish parents. At the age of five years his parents moved with their family to Erie county, Penn. At 13 he left home, buying his time of his father, to labor on public works in summer and go to school in winter. At 18 he leased himself to a physician for three years, receiving \$30 the first year, \$50 the second and \$70 for the third years' wages.

During this early period, when but a mere boy and with scanty means, he commenced the exercise of that practical charity and usefulness that has so distinguished him through life. For two years of this service with the physician he maintained 13 orphan children at school, paying all expenses of tuition, school-work, books, etc. One of these boys is now an eminent lawyer of Ohio.

Starting in the study of medicine with this physician, he soon bought out his patron's drugs, procured books and continued studying until 24, in the meantime commencing the business of merchandising, having an adopted boy for clerk.

At the age of the doctor (for he had been admitted to practice), married Margaret Bradish, of Erie county, by whom he had one child, James. He also adopted an orphan girl at this period. After six years of married life Mrs. Webber died. The last adopted girl marrying, he adopted another, also another poor boy. He then sold his practice in Erie, Canada, leaving the girl to be educated four years at an academy in New York. He then married. He also left his own son there with his grandmother for the better continuance of his education. The adopted boy he educated liberally in Canada, and he is now a skillful business man of New York. In Canada he adopted another boy, now a merchant of Illinois. The doctor remained two years in Canada, then removed to Chicago, a place where he engaged in the building and public works. He prospered in business, though always carefully honest, and his monthly bank account at Chicago often exceeded \$150,000.

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millage and mining with varied results, and in the meantime built the Sierra county edifices, roads and bridges. In '54 he went to Sacramento valley for five years and raised wild horses. In '59 came up to Sierra valley, engaged in his profession, and in raising sheep, goats and cattle. In '60 built the hotel at the lake which soon after took his name, in '62 established a ranch in the north end, where he now resides in summer. During this period he fostered several poor boys, assuming also the care of a second cousin, Joseph C. Webber, and educating him to his own profession. The young man graduated at Toland Medical College, S. F., third in his class, came home to Sierra valley and commenced practice with most remarkable success, and in a few years had become so well known that he had the entire population, as evinced by the universal sorrow that was exhibited and still is often expressed, occasioned by the early death of this promising young physician in 1871.

Dr. Webber at his Lake.

It is at the lake, while sitting on the hotel porch or rowing a skiff and trolling for trout at the close of a delightful summer's day, that the good doctor has time to tell you of his numberless boys and girls and his interesting business adventures, described with deep feeling, and with inimitable zest. To the improvement of the premises and the comfort of his guests he has devoted the energies of the prime of life. He loves this spot as dearly as ever Swiss loved Alpine home, and during declining years he resorts here annually to meditate upon a life well spent, and to plan still other schemes of good.

As early as 1862 Dr. Webster, then building the Downville, hearing of this beautiful lake and valley on the Henness pass, hastened hither, hiring a guide for \$10, who betrayed the doctor and posted a penciled notice of location on a tree and would not remove it until paid \$50 more. In '66 the hotel was built, and for a few years after immigrant travel continued brisk over the easy pass; besides the discovery in '62 of the Meadow lake gold-bearing quartz and the quick up-building of a large city there made business lively, but after three years of determined labor it was found that the sulphurets prevented the Excelsior rock from giving out its gold in paying quantities. In the same year the large town was deserted. At the same time period the progress of the railroad over the Donner pass began to lessen the travel on the Henness, and gradually the Webster premises assumed the character they are noted for to-day—a health and pleasure summer resort.

There were no trout in the lake when first discovered manifestly prevented from entering it by reason of the high cataract of 110 feet. In '60 the doctor began introducing trout of two varieties, silver-sides and red-fish. Four years after he was enabled to set this delicious fish before his guests as desired. Subsequently other parties proposed to clear the lake, and the doctor was told that he was assured that it was always filled with trout, but the doctor proving his claim to the satisfaction of the Fish Commissioners and complying with legal provisions, has acquired possession of the fish, pays taxes upon them, and, assisted by the law, carefully guards against their being caught out during the spawning season, which would diminish one of the most enjoyable pastimes of summer and thus cut off one of the most appetizing items to the bill of fare.

The wealth of Dr. Webber has been reduced by his benevolent projects, the liberal assistance of relatives, (once his only friends), of his property to two brothers, by mining failures, and hard winters, to the value of a few thousands now, but still he has sufficient to prevent reliance for support solely upon the profits of his hotel or the practice of his profession. The poor and unfortunate are entertained gratis, until they can find employment, and the sick either in Sierra valley or those who come to the lake for treatment, if indigent, are cured free of charge.

Dr. Webber has two mortal enemies, against which he is ever on guard, erysipelas and typhoid pneumonia. An attack of erysipelas many years ago destroyed the sight of his left eye, another compelled the amputation of the index finger of his right hand. Pneumonia has recently brought the doctor twice to the verge of the tomb. The people of Sierra valley pray that he may long be spared to them, but whenever Death shall come, be it sooner or later, he will but recall the spirit of a true man which has been sent among us to illustrate the high capabilities, uses and destiny of humanity.

The monument of Dr. Webber is already erected—the noblest of monuments, grateful memories in the hearts of those whom he has fostered or cured. His lake, which must always be a resort for naturalists and pleasure-seekers while California is inhabited by a free people, will forever locate the scenes of his later deeds; while two pretty plants of the Sierra, *Ivesia Webberi* and *Astragalus Webberi*, lately distributed to the botanists of the world, have indelibly inscribed his name upon the records of science, to be spoken, written, printed and inquired about by the lovers of nature, of all languages, in all countries, through all time.

Webber Lake, March 4th, 1877.

## Silver in Oregon.

Silver in Washoe has been so immense and of a development so permanent that all other enterprises on the Pacific coast have been subordinate to and dependent upon the results attained in the production of that metal. In the meantime the continent has been scanned throughout the Pacific slope from Arizona to Alaska, for other Washoes, and although Oregon, Utah, Arizona, Montana, British Columbia, and also Alaska, have contributed to the stream of precious metals flowing from this coast, Nevada and Idaho are the only regions where silver-bearing lodes are found of a character to warrant the heavy investment of capital to an extent required for mills, shafts, tunnels, machinery, etc., to perfect the bullion for market.

After the discovery of the Washoe silver lodes it caused placer and quartz mining in California to hold a secondary place in the estimation of capital. The fabulous results of speculation in Nevada for nearly a score of years has so centered popular attention in that quarter that every source of finance has been drained to meet the assessments for developing the numerous argentiferous veins catalogued by the San Francisco stock boards on the Comstock and adjoining lodes; and it required all the speculative capital of the Pacific coast to develop those mines.

The silver-bearing regions of the Columbia basin, although as rich and extensive as Mount Davidson in at least two localities, have remained undeveloped merely because mining investments could not afford the heavy expenditures required in more than one locality at a time. From the signs of the times it is quite apparent that the best days of Washoe have culminated because the Comstock has been comparatively worked out by exhausting the attainable ore to a depth beyond which it seems no longer dividend-paying to delve.

Eastern Oregon, in Grant county, is the next region on the Pacific coast where true fissure veins of silver-bearing quartz of Washoe extent is found, and where silver-producing enterprise will next erect those stupendous and expensive

adjuncts of the business. The movement has commenced on Granite creek, about sixty miles from Canyon City.

The Monumental silver mining company, organized in Portland, (of which Wm. Grant, Esq., of this city is one of the directors) has the material on its lode to become the peer of the Gould & Curry or the Consolidated Virginia, if, like those corporations those interested will organize proper appliances for extracting the bullion. The company has located several thousand feet, and there is area for all Washoe to transfer its industry in the same vicinity, which is sure to take place in the course of no lengthened period. In the meantime, while shares are cheap and no assessment to be feared, as the company are only selling a limited number to expended in the development of the mine, it would be good business policy for our citizens to secure an interest before a "Washoe excitement" reaches the great Northwest.

We have gone into this detail to inform our readers that the next mining excitement bids fair to be in Eastern Oregon upon silver-bearing lodes, and we are anxious that our own citizens should have a share of those arising values which will pass them to the San Francisco stock exchange if they do not take time by the forelock and secure an interest at this time in what is soon to become the northwest bonanzas.—*Oregon Mountaineer.*

### The Dayton Ditch.

The *Sutro Independent* says: The work on the Dayton ditch—one of the largest irrigating ditches in the State—is fast approaching completion. The company of fifteen carrying on the work are chiefly citizens of Dayton, among whom are: W. W. Byron, C. W. Mallett, Jerry Gantz, David McClelland, A. Perkins, K. R. Hacket, Frank Hauger and George Barrett. The ditch begins at the Carson river, just below the Ophir dam, and extends along the river until near the mouth of El Dorado canyon, when its course is to the eastward. Its total length when finished will be six miles, and near its terminus a branch ditch, a mile and a half long, leading to the river at Gee's ranch, will be excavated, in order to afford facilities for irrigating a rich portion of land annexed to the Sutro tunnel grant and to carry off whatever waste water there may be.

Along its route thus far a number of small tunnels have been excavated, one of which is 100 feet long, and at least 100 rods of flume will be required before the work is successfully completed. The dimensions of the ditch are such as will carry, when the stage of water in the Carson is low, 1,600 miners' inches of water, which amount, it is thought, will be sufficient to irrigate the company's tract of 1,500 acres.

The work was begun last December, since which time it has progressed until it now reaches a distance of four miles. The remaining two miles, it is thought, will be completed in the course of two and a half months, when work will at once begin on the branch leading to the river. The cost of the enterprise thus far has been \$6,000, and its probable cost when finished will be \$10,000.

The company's land through which the ditch runs and is meant to irrigate, was taken up year ago under the desert land law, and is located on the other side of the Carson. It is nicely located, is fertile and abounds most luxuriantly in the mexicanstihle sagebush. Mr. Fawcett, from the State Surveyor General's office, has been surveying for the company and setting stakes for the subdivision of the land taken up.

Forest City Mines.

A correspondent writing to the Nevada *Transcript* from Forest City, says: This is one of the liveliest mining camps in the State, but yet it is not as lively as it has been, on account of the scarcity of water. They are unable now to run a full force in the Bald Mountain mine. This is the largest and best paying gravel mine in the State. Their tunnel is run in three-quarters of a mile, and the cars are drawn by a locomotive. They employ during the water season, three hundred men, but at the present time about eighty. The mine is under the superintendence of W. H. Willis, and is the best managed in the State. They have taken out since the mine was opened, over \$1,000,000. It is paying better this season than ever before. The North Fork company continue to take out some of the richest quartz ever found in the State. The ledge is well defined having two perfect walls, and varying from two to six feet in width. This mine is under the superintendence of W. Baylis. Up to this time they have taken out and worked in a hand mortar, over \$40,000. The rock still continues as rich as ever. They are now employing forty men, and are still running their main tunnel ahead for gravel. They have about one hundred and fifty feet further to run before striking the gravel. Up to this time the company has made no arrangements for the erection of a mill to crush the immense amount of quartz they now have on the dump, and it is daily increasing. It is designed to ascertain the full extent of the ledge, or sufficiently so to determine whether it will warrant the expense of putting up a mill. It will be decided definitely in a short time. The Mammoth Spring company are still running their main tunnel ahead. They are on the rim, and will have about two hundred feet to run before getting to the gravel, still the mine is paying expenses on the rim of the channel.

## Pioneer Reduction Works.

These works, which are established at Canada hill, near this city, says the Nevada *Transcript*, are now in full operation, and competent judges assert most positively that the new process is a success. The following is a brief description of the working of the ores, as witnessed by quite a number of our citizens a few days ago: The ore if wet is first run through a drying furnace. From thence it is conveyed by an elevator to a hopper, which deposits it in regular quantities in a revolving roasting furnace, where it undergoes very thorough oxidation. From the furnace it is conducted by means of elevators to hoppers, which feeds it into burr-stone grinders, similar to those used in grist mills, where it is reduced to a fine powder. From thence it is conducted to a settler or washer, where all matter that is noxious to quicksilver is dissolved and removed. From thence it is taken to a large amalgamating tank, where it undergoes a thorough process of agitation and mixing with quicksilver. The quicksilver, by means of a strainer and elevator, making a continuous circuit through the material in the tub. All the chemicals in the process are used in this part of the work, and only in contact with the quicksilver for the purpose of keeping it constantly in order. From this tank it is drained off into another tub called a "dolly," and from this to an agitating machine called a centipede, which is the last work done on the ore before it finally escapes down the waste sluices, except that the settling from the two last tubs are caught in a waste tank, and if found to contain matter worth reworking it is taken to the drying furnace and put through the process again. The ore passes from one point to another by means of machinery, which is automatic in its work throughout. Those who were present to witness the practical workings, we believe, generally united in declaring the process an undoubted success. It is the purpose of the company to erect machines as fast as the demand calls for them. They propose to work ores up very closely to a fire assay and to do it so cheaply that many mines, which will not pay as at present worked, will become valuable property. The machinery throughout worked to a charm and the results can be gained from the following assay made by J. J. Ott, of this city. The roasted material when it entered the amalgamator, after passing through the roasting furnace and the grinders, contained, according to Ott's assay, \$15.70 per ton. The clean-up showed that \$14.88 of it had been saved, and only 82 cents had passed off in the sluices. In other words, the percentage of gold saved was 94.8. The ore under treatment is generally conceded to be rebellious and hard to reduce. The time used in the reduction of this lot was only three and a half hours, whereas the regular time should have been six hours. Prof. Crosby asserts that the result is not better than the machine can do at all times, and he stands ready to demonstrate it to any one having ores to reduce. Prof. Crosby extends a cordial invitation to those having sulphurets or ore to be worked to bring them on and witness the test, and those interested in mining are also invited to go and see the machine and judge for themselves.

### Early Washoe Machinery.

Persons now visiting the Comstock, who have not been here since the early days, are much surprised to see the huge engines employed in all our large mills and in the hoisting works of the leading mines. The ponderous pumping machinery is also looked upon with astonishment, and contrasted with the slight and feeble apparatus that did duty in the same line of business in former times.

In the early days of Washoe, the stockholders of a mining company stood aghast and were amazed almost to speechlessness when their Superintendent ventured to ask for an engine of 60 or 80-horse power. They thought the company would be ruined by such extravagant notions.

When such engines were finally procured and set up in the mills and hoisting works, a day was appointed and scores of people—ladies as well as gentlemen—were invited to see them put in motion. A great feast was provided and spread in some part of the new works; speeches were made, champagne flowed like water and beer was drank by the barrel. Occasionally a band of music was present and dancing concluded the festivities. Companies that had paid out sufficient money to purchase an engine of 80 or 100 horse power became reckless, as it were, and no longer cared for expenses.

New engines of 500-horse power are started up, and nobody except those particularly interested knows anything about the matter; and, without a word to outsiders, pumps are put in motion that would have torn down the works of early days and washed all the revelers collected in them down the side of the mountain. All the machinery in our primitive hoisting works wouldn't have furnished ballast for a balance hob of the present day, and a section of the pump column now in use would then have made a first-class smokestack. — *Enterprise*,

WAGES IN SAN JUAN.—Miners in San Juan receive \$3 a day and board, or \$4 where they board themselves; boss carpenters, \$4@5; carpenters, \$3.50@4; stone masons, \$4@5; laborers, \$2.50@3; other trades about the same in proportion.



## Specie Payment Stamp Mill.

This is a new mill recently built on the north bank of Clear creek, says the *Colorado Miner*, near the center of the town of Idaho Springs. It is owned by the Sunshine mining company of Troy, New York; and is under the immediate superintendence of W. A. Peck, Esq.

The dimensions of this building are 30x40 feet; it contains three batteries of five stamps each, and is used solely for the treatment of auriferous quartz. The machinery is run by a 30-inch Baker turbine water-wheel, and the supply of water is unlimited.

The works have been in successful operation a little over a month, and with such encouraging results, that the owners are now preparing to put in 10 more stamps. Up to the present time the stamps, etc., have been kept running on mineral brought from the Specie Payment mine, which is the property of the Sunshine mining company; but as soon as the additional stamps are in place custom work will be attended to to some extent. In the present condition of the mill one and a half cords of quartz can be handled daily, and when the improvements which are now in progress are completed, its capacity will be nearly doubled. The stamps are kept running night and day; and the works require the attention of but one man on each shift of eight hours.

The means employed for the extraction of the precious metal is known as the "wet amalgamation process." A small stream of water is kept continually running through the stamps, and on each side of the dies narrow copper vessels are arranged, and closely confined so that the water or amalgam cannot escape except through the proper channel. The quicksilver is placed in these coppers and amalgamates with the gold as it is freed from the rock by the stamping process. The principal portion of the amalgam is retained in these receptacles, though a considerable amount passes out with the water and tailings over slightly inclined copper tables, to which a small percentage of the amalgam adheres. At the lower edge of these tables coarse blankets are spread, over which the water holding the tailings in suspension passes; here the small particles of iron pyrites and quicksilver are deposited, while the lighter residuum is washed away. The blankets are carefully washed about 18 times in 24 hours, and the resulting sediment is transferred to a "dolly-tub;" water is added and the whole is agitated by a screw wheel for a short time; more of the refuse is carried away by the water, and the tailings—still more concentrated—are placed in the amalgamating pans, of which there are three. Here the mass is triturated still finer by an arastra-like process. Nitrate of mercury is added which attacks the iron and frees the quicksilver, which in turn unites with the gold; the refuse is then drawn off and the amalgam is collected and retorted.

Everything is cleaned up and the amalgam retorted about twice each week. The greatest care is taken to prevent the washing away of the amalgam, and the waste of quicksilver is exceedingly small. The appointments of the mill are good, and, apparently, it does not depend upon anything but the permanency of the mines for its successful continuation.

## San Juan Reduction Works.

The following list of mills, smelting works, and concentration establishments now erected in the San Juan will be found of use not only to miners but to the scores of metallurgists, graduates, and undergraduates of mining schools who are preparing to make a study this summer of gold and silver beneficiating works. We have prepared it with great care, giving the capacity and system employed in each, and other notes of interest:

Pennsylvania works, Rosita. Capacity, 12 tons. System, roasting and lixiviation, terminated by precipitation or amalgamation to suit varying classes of ore. Ores, sulphurets of silver, gray copper, and galena, in a baryta gangue. Steam power.

Mallett's works, Rosita. Capacity, 10 tons. System, roasting, leaching, and precipitation. Ores, as in the last case. Steam power.

Crooke Bros.' works, Lake City. Capacity, 50 tons. System, dry concentration, leaching, and precipitation. Ores, argentiferous quartz, galena, and blende, with iron and copper pyrites.

George Green & Co.'s works, Silverton. Capacity, 10 tons. System, lead, smelting. Ores, mainly heavy galenas.

Animas Forks mining company's works, Animas Forks. Capacity, 35 tons. System, wet concentration.

Van Gieson's works, Lake City. System, roasting, lixiviation, and precipitation.

Rough and Ready works, Silverton. Capacity, 10 tons. System, same as Green & Co.'s at same place.

Melville silver mining company's works, Silverton. System, crushing and amalgamation by the Walker process.

Besides these there are a number of small works scattered at different points, the most of which have not yet been placed in complete running order.

The addition to Crook's works at Lake City are being rapidly pushed forward. When completed their capacity will be over one hundred tons of ore daily. This includes the concentration, stamp, and smelting works.—*Colorado Springs Gazette*.

## USEFUL INFORMATION.

## Combustion of Oily Refuse.

We give below a valuable report, taken from the columns of the *Woolen Manufacturer*, of certain experiments recently made in England, with the various oils in common use in factories. The results reached by Mr. Coleman are the same as have frequently been obtained by chemists in this country. We commend the article to the attention of our readers generally:

Mr. J. J. Coleman, of Glasgow, has recently transmitted to the *Société Industrielle*, of Mulhouse, France, a memoir on the spontaneous combustion of oily refuse, and on the relative inflammability of the different oils employed for lubricating purposes. He describes a series of experiments upon fragments of cotton, linen, jute and woolen waste, saturated with oils of different natures. The materials were placed in a box of tin, having a double bottom in which steam entered, so that the part which received the refuse could be maintained at a temperature of 180° Fahr. A thermometer was inserted in the oily substance so that the variation of temperature occurring therein could be noted.

The results obtained show, first, that any vegetable or animal oil inevitably takes fire after a few hours, under the above conditions. On employing cotton waste, the mass burns quickly and with flame, in contact with the air. Wool refuse is slowly transformed into a black carbonaceous mass. Second, the addition of mineral oil—known as lubricating mineral oil—serves to retard the spontaneous combustion of vegetable or animal oil if mixed in small quantity. If a large amount be added, inflammation is entirely prevented. The mineral oil used by Mr. Coleman is a very dense product, having great viscosity and emitting no inflammable vapors, even in contact with an ignited body at any point below 338° Fahr., in other words, remaining safe at temperatures at which mixtures of less dense mineral oil or colza oil burns. The addition of 40% of mineral oil is sufficient to prevent spontaneous combustion. Twenty per cent. doubles the time necessary to determine conditions favorable to the same.

There is another advantage to be gained by mixing mineral oil with that of vegetable or animal origin, in that the latter is thereby prevented from resinifying, or thickening, on prolonged exposure to the air. Mr. Coleman exposed in his hot air bath for a period of 48 hours, vessels containing olive, colza, sesame and cotton seed oils. The first thickened, the second the same to a greater degree, the third still more and the last yielded a semi-liquid, amber colored mass. The addition of 20% of mineral oil caused all to remain perfectly fluid. The author concludes that, for the lubrication of machinery, it is advantageous to employ a mixture containing as much mineral oil as possible, while retaining the material at the proper degree of viscosity. Colza and other oils employed for lubricating heavy machinery are greatly improved by the addition of from 10% to 20% of mineral oil, the small viscosity of the former preventing a mixture of greater proportions of the latter. For spindles, on the contrary, it is better to use a larger amount of mineral oil, making a mixture of about the viscosity of sperm oil.

## Keep Circular-Saw Teeth Sharp.

In the "Lumberman's Hand Book" issued by Messrs. Diston & Sons, are found the following hints: Makers are annoyed by having saws returned for repair in such a condition that it is impossible they should go through the wood, from the miserable way in which they have been filed and set—some jammed all to pieces, some not half filed, some not filed true on the face or back, while others are all shaves but the right one in the throat, leaving no chamber-room for dust or chips. Some saws have a bad pitch, some no pitch at all; some out of round; some with irregular or long and short teeth, one up and one down. In many cases they are returned broken. Why? Each tooth of a 24-inch circular saw goes through the wood 2,000 times per minute, 120,000 times per hour, 1,200,000 times per day, and if not sharp, the saw is strained at the root of the tooth thus often, which frequently not only closes the set, but must eventually break the saw; for although steel is strong, continual straining will make it tender, and it must break. The tooth becomes dull on the side or under the point in proportion to the amount of feed; thus, if the tooth takes one-eighth inch hold at each revolution, it will become dull for one-eighth inch below the point, or more if the feed be greater. A diamond will not cut if dull; why should a saw? A few minutes filing two or three times a day would save ten-fold the amount of time and labor expended in running an imperfect dull saw, also making a saving in the amount of power consumed, and a heavy percentage in the quantity and quality of lumber cut. It is a mistaken idea that there is a saving by not taking time to sharpen a saw. If it were a razor, and the man that works it obliged to shave with it, it would be kept sharp. It is quite as essential that a saw be sharp, as a razor or plane, or any other cutting instrument; and when proud, or full and sharp, it does not require one half the set or power on the same feed.

**DECISION ON FULFILLMENT OF CONTRACT.**—We read in an exchange that after four years' litigation, a case has been decided in England which is of interest, as establishing a well recognized principle of law. It determines that when iron is passed by a buyer's engineer and a certificate given, the consumer thenceforward has no right to sue for damages for any defects which may afterward appear. In 1871, Messrs. Hopkins, Gilkes & Co., of Middlesbrough, contracted to supply a large quantity of iron rails and fish plates to an Anglo-Russian railway company—the Dunnberg-Witepsk. The rails were rolled under the superintendence of a representative of the engineer (Sir John Hawkshaw), and he watched them at every step, testing them whenever he chose. The rails were completed according to contract, and Sir John Hawkshaw gave the necessary certificate, after which payment was made. The rails were laid down, and, after standing the severity of a Russian winter, various defects were noticed in them. The railway company at once sued the manufacturers for £90,000 damages, for what they alleged to be breach of contract. This was in 1873. The matter was referred to arbitration, and the arbitrator, Mr. J. B. Maule, Q. C., decided in favor of Messrs. Hopkins, Gilkes & Co.; but before making his award, he stated a special case to the law courts, raising the question as to the finality of the engineer's certificate. In delivering their opinion on this, the judges unanimously agreed that the plaintiffs' right of action was destroyed when the rails had been completed and certified as being according to specification.

**THE PARIS EXHIBITION.**—Sir Julius Vogel, writing to the *London Times*, suggests that at the close of the forthcoming International Exhibition at Paris, there should be a supplementary exhibition of all the articles which are praised by the jury. He says: "I cannot fancy a more useful, enjoyable and instructive exhibition than this would be, comprising, as it would, in a comparatively small space, all that was most excellent and economically valuable in every variety of production and manufacture. The prospect of this subsequent exhibition would be an enormous incentive to exhibitors of a really good class. To occupy a place in the prize exhibition would mean the certainty of their goods being examined and appreciated by many thousands of intelligent people."

## GOOD HEALTH.

## Sunstroke and Apoplexy.

**EDITORS PRESS:**—To avoid sunstroke it is well to place a wet cloth on the head; but working-men cannot well attend to this. Use two linings in the top of the hat. They may be of paper or cloth, one blue, the other yellow, and are worn as a covering in your hat. For a sudden remedy, as a substitute, use green leaves.

I don't approve of using ice or cold water about the head in sunstroke or apoplexy. If taken in time, either can be cured and the person afflicted restored at once. In using cold water Nature, to restore the parts, sends hot blood wherever cold applications are used. Tepid water prevents the rush of blood and will cool the system the best.

Where you find a case of sunstroke or apoplexy, as soon as possible, apply water heated to from 110° to 115°. Use two or three pailful. Pour it on in a small stream; let it fall a few inches, directly on the back head at the junction of the cerebellum with the spinal column, in or near the hair. Then set the patient up and rub dry. The warm water passes off over the cheeks. Then apply alcohol or stimulants to the neck and back of the head. This is a remedy not known in medical practice and the recipe is of great value.

Wool is a non-conductor of heat, and there can be no objection to wearing it in warm or hot weather. Fifty years ago, persons on a farm wearing woollen clothing were derided; all wore tow cloth in Vermont. Light woollen goods and thin, so that air can pass through, are better and cooler than thick heavy cloth made from flax.

In sunstroke and apoplexy very hot water should be applied to the feet and ankles immediately; (hot packs will do.) This draws the blood from the head.

As to using blue lights and other prismatic lights of glass, I think I am the first that used them, scientifically, in this country.

Rutland, Vt.

SOLOMON W. JEWETT.

## Marsh Malaria.

The following, which we take from *Harper's Weekly*, gives some interesting facts with regard to a theory first broached during the war by Dr. J. H. Salisbury, then a resident of Cleveland, Ohio, pending investigations as to the origin of chills and fever, which were much talked of at the time. We believe he succeeded in cultivating this disease in ordinary flower-pots, and propagating it also by bringing persons within the influence of the disease-producing plants:

One hypothesis in regard to the origin of marsh malaria refers this to the development of certain microscopical growths, which are sup-

posed, by their dissemination, to effect a lodgment in the human system, and there set in motion organic changes, producing the various phenomena of disease.

The subject has been elucidated by the recent researches, in Rome, of Messrs. Langi and Terrigi, who have been studying the microscopical fauna of the Roman marshes. They find, in the cells of the algae collected there, certain dark granules penetrating into the endochrome or into the chlorophyll of algae having this substance. These become more and more developed with the death and decay of the algae, and finally turn black, and either cause or accompany a condition of putrefaction which results in their extensive dissemination.

According to the authors mentioned, the marshes of the Campagna, in the winter season, develop large masses of this algae, which become decomposed by the drying up of the ground, afterward producing planarianous land plants. Toward autumn the marshy portions of the undried land exhibit a corrupting layer of slime, abounding in the dark granules referred to, and various animal infusoria. These are found in abundance in the atmospheric dust of the Campagna, and are largely developed from it by cultivation.

The pigment granules found in the liver and spleen of individuals suffering from malaria, have similar properties to those of the ferment granules in question, and they can be developed quite similarly. Terrigi has found that the best method of preventing the decay and development of these granules is in the application of chloride of lime, of lime, or of chloral. A filtering of the atmosphere several hundred feet above the surface of the earth, revealed the presence of these bodies, which also appeared in the liver and spleen of guinea pigs that had been kept for some time at the level of the marsh.

## United Work for Health.

How fitting that the mothers of the country should join hands and brains in the service of the beneficent goddess Hygieia. A sure note of genuine progress has been sounded by the representative women of Louisville in the formation of a society, whose "special aim is to promote among women a knowledge of the human system, the laws of life and health, and the best means of relieving sickness and suffering."

The articles of the constitution give a condensed statement of the aim of the society: The society shall provide instruction upon all subjects belonging to the science of man, especially hygiene, physiology, psychology, and anatomy in their practical bearings upon the prevention and cure of disease, the training of children and youth, and the general improvement of the human race. But no subjects shall be introduced for consideration of the society which have not a direct bearing upon social and personal improvement and happiness.

The society shall procure a collection of apparatus, illustrations, engravings, etc., as a physiological museum, to which the members of the association shall have access, and a suitable library for the use of the members.

At the first meeting 100 members were received. When the mothers began to ask for thorough instruction upon such subjects it is a happy augury for the future of their children. For, alas, too many of the mothers, in the past have been fed upon the sour grapes of ignorance, and "the children's teeth have been set on edge."

**RECOVERY FROM ELECTRIC SHOCK.**—The *Philadelphia Inquirer* describes a case which is somewhat hard to credit. It says a young man named Warrick, who lives near Chew's Landing, New Jersey, was struck by lightning while in a field near his house. The stroke shattered a tree that was some distance from where he was standing, and prostrated him. It was believed he was dead when picked up, and for several hours afterward he gave no sign of life. His father applied to Dr. Urquhart, who advised Mr. Warrick to apply to his son's spine and waist cloths soaked in a mixture which the doctor made for him out of oil of cayenne and water, and with whiskey, of which about three tablespoonfuls were added to the cup full of water. Mr. Warrick did as he was directed, and his son, although he had been lying in a stupor for 16 hours before the application of the cloths was made, spoke in about five hours after the first application. He has since been progressing favorably, and it is not unlikely that he will fully recover. The case will probably be brought to the attention of the medical universities of Philadelphia.

**CORRECTIVE IN LEAD POISONING.**—Workmen employed in the manufacture of white lead are always liable to lead poisoning, both by inhaling the dust and in touching the lead with the hands. Various correctives for this have been employed, and among these the latest and most simple is a careful washing of the hands in petroleum. Three washings a day are reported to be sufficient to prevent all serious danger of poisoning. The benzole in the petroleum is said to scour the skin and remove the dust of lead, and the fatty substance in the oil prevents the absorption of the lead salts. The experiments made with petroleum used in this manner give such good results that it is proposed to use the same material as a guard against poisoning in other industries where the salts of copper or mercury are employed.



# MINING AND SCIENTIFIC PRESS

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Our latest forms go to press on Thursday evening.

SAN FRANCISCO:

Saturday Morning, August 11, 1877.

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## The Week.

In connection with mining matters the principal event of the week has been the dismissal of Curtis as Superintendent of the Ophir, Mexican and Union Consolidated mines, and the appointment of W. Hendy, Superintendent of Imperial Con., in his stead. The affair has created considerable talk in mining circles, and is elsewhere referred to in this issue.

The heaviest single bullion shipment ever made from the Comstock was made this week. It consisted of 173 bars, aggregating \$771,446. It came principally from the bonanza mines, which produced last month \$3,000,000. Improved prospects are met with in Overman, Justice, Yellow Jacket and other mines, and the undiminished yield as well as increasing good prospects of the bonanza itself, give a hopeful and encouraging look to the whole mining situation.

The testimony in the Eureka Consolidated mining suit is now all in and the array of experts have been dishanded. The decision has not yet been rendered. The testimony will shortly be published in full, so that we will have an opportunity of comparing the statements made by the experts, some of which, we are told, were quite extraordinary.

The city has had the infliction of a large fire this week, destroying buildings covering over two blocks, but the loss is light compared with that with the area of the fire.

The Mechanics' fair opened this week, and we give in another column the opening address of the President of the Institute. We shall give all there is of interest in connection with this exhibition during its continuance.

## The Errors of Mining in the Past.

During the excitement that followed the discovery of the Comstock lode, almost the entire State of Nevada was overrun by prospectors, who, in their ignorance and hurry-scurry, proceeded to locate everything having even the semblance of a mineral-bearing lode, and, without taking proper measures to determine whether they contained any gold and silver or not, hastened to lay out mining districts all over the country so imperfectly prospected and hurriedly covered up with these mining claims. Then followed the organization of companies, the most of them incorporated with a large amount of nominal capital, for the ostensible purpose of opening up and working these so-called mines.

It being generally believed that the ledges taken up contained enough of the precious metals to warrant their exploration, many people on this coast, and even many in the East, felt disposed to adventure some portion of their means in this new and promising industry, which resulted in a good deal of money being embarked in it during its earlier stages. As ignorant of ore extraction and reduction as they had already shown themselves to be of searching after and securing deposits of value, every manner of folly and mistake was committed by these embryo miners—some the results of ignorance and inexperience, but more, perhaps, of gross negligence, criminal mismanagement, or downright fraud; the history of these operations being anything but creditable to the business sense, to say the least, of those who were more especially responsible for them.

The people in their confidence contributed freely, and the recipients of their favors spent it in a princely way. Everybody was enthused and everybody blundered. The over-sanguine and self-sufficient rushed to the front. Men without any experience in the business were appointed superintendents of mines. House carpenters undertook to put up mills, and every man assumed to be his own metallurgist and assayer. As a consequence, nearly everything was done wrong. Costly mills were freighted to remote sections and put upon lodes before any developments had been made, and very often upon such as contained little or no ore. Shafts and tunnels were started at the most improper points; roads were constructed and towns built far in advance of the wants of the districts explored.

It would be thought that a few years of this sort of experience would have sufficed to bring people to their senses and put a stop to this profitless expenditure. But it did not; money continued to be contributed freely, and this reckless style of disbursement went on with little abatement for eight or ten years, the business having met with its first signal check in the White Pine fiasco, though this did not by any means prove to it a final extinguisher. We have since that had a number of mining excitements, which, though of a rather milder type, have not failed to cause their victims much disappointment and loss, as the deserted towns and ruined mills of Schell Creek, Panamint and various other nearly abandoned districts sufficiently attest.

While so much of a disparaging kind has been occurring in the department of practical mining abuses of a still more reprehensible character have marked this speculative branch of the business; and this, too, without the poor plea of ignorance and inexperience to partially excuse their commission.

In view of the foregoing facts, so discreditable to our good name as a community and so damaging to our financial sagacity, it seems to us that all parties engaged in mining pursuits, in whatever capacity or department of the business, should feel called upon to see that it is conducted in a more honorable manner and upon a more business-like basis hereafter. Never elsewhere have such grand opportunities been presented for the profitable employment of labor and capital as here. Never before has any industry been sustained with a liberality like that which has backed up mining on this coast. For nearly 20 consecutive years it has been nourished with a generosity appalling in view of its meager reward. We are not un mindful of the vast treasures that have been gathered from our gold and silver mines, nor of the splendid success that has attended individual effort in thousands of cases. These are well understood and have been sufficiently talked about. It is the other phase of the business that now requires to be considered. Having said so much in glorification of past production, let us see what can be done toward correcting present abuses. As a first step towards this end, let the same economy be exacted and the same rigid responsibility attach in this as in every other calling. The idea that all who invest money in mining ought to realize a speedy fortune out of it should be dismissed. Let men cease to gamble, and engage in this as they would in any other legitimate vocation, keeping in view security of investment and the certainty of a moderate rather than taking desperate chances of a large profit. A radical reform must be worked or capital can no longer be commanded for prosecuting this business.

OWING to the low stage of water in the Carson, the Eureka mill is only working at about one-third its capacity, crushing about 60 tons per day on an average.

## Our New Offices.

The business offices of the MINING AND SCIENTIFIC PRESS and PACIFIC RURAL PRESS were recently removed to more convenient and commodious premises on the corner of Pine and Sansome streets. This is on the same block as our former offices but on the Pine street corner—No. 202 Sansome street. It is nearer to the central street of the city—Market street, and in a fine, handsome building, where we have more room for the different branches of the business. Dewey & Co. have leased these premises for a term of years and are now fitting them up in good style, so that our facilities will be much improved. The bookkeepers, mail-clerks and engraving department will have more commodious quarters than heretofore.

Dewey & Co.'s Patent Agency is also greatly benefited by the change. The consultation rooms are more commodious and convenient and more space is given for the library, models, etc. This change has been made necessary by increased business, for which our former facilities were inadequate. The new location is a central one, in a first-class building and is far superior to that we leave. As we have leased the new premises for a term of years, we have fitted them up with a view to the future as well as the present.

The editorial, composing and press-rooms of the MINING AND SCIENTIFIC AND PACIFIC RURAL PRESS still remain at 414 Clay street, where they have been for the past eight years; but our correspondents and subscribers will remember that the new business offices are at 202 Sansome, about three-quarters of a block south of the old offices.

## Big Bullion Shipments.

The heavy bullion shipments from the Comstock mines are such as to astonish every one, even those familiar with money matters. It must surprise them even more than others, as miners know how to appreciate such figures. The single bullion shipments seem to be getting bigger and bigger. The *Virginia Enterprise*, of the 7th inst., says on this subject:

"These 'biggest shipments' are getting to mean something these days. There was a time when the Belcher, at three hundred and thirty odd thousand dollars, made it, and it was thought wonderful, as indeed it was. Then little by little, these 'biggest shipments' grew bigger yet. At first some \$300,000 were added and bragged over. Then \$400,000 *plus* was reached. And then a jump of over \$100,000 was taken, and so the biggest was increased till about \$670,000 was reached, and there the record has stood for some time past.

The amount shipped last evening by the bonanza mines was 173 bars, aggregating \$771,446.85, and yet there was bullion left in the office which was not taken. Of these shining bars California turned out eighty-six, valued at \$381,084.67, making a total to date and for the past fiscal month of \$1,399,331.79. The Consolidated Virginia shipped last evening eighty-seven bars, valued at \$330,362.18, making a total to date of \$1,305,023.64. The Consolidated Virginia clean-up is to come. The total for the two mines so far this month is \$2,704,375.43. The Consolidated Virginia clean-up will increase this to about \$3,000,000."

The amounts for July are as follows: California, 328 bars, valued at \$1,399,331.79; Consolidated Virginia, 245 bars, valued at \$1,305,043.64.

## Rich Showing from Arizona.

There has been open to public inspection for the past few days a lot of remarkably rich ore, or rather, perhaps, we should say, chunks of metallic silver, lately brought from Arizona. This lot, which consists of 2,230 pounds, is to be seen at the office of the Germania Life Insurance Company, 216 Sansome street. It comes from what is known as the Stonewall Jackson claim, in Globe district, and it is calculated that it will yield at the rate of \$20,000 per ton, most experts estimating the yield somewhat higher.

This lode carries a streak of similar stuff as far down as it has been opened, a depth of over 80 feet. This streak, which is not over half an inch wide on the surface, gradually expands until it reaches, at the depth of 45 feet, a width of four and one-half inches, which it holds on an average as far down as the lode has been opened. On each side of this rich streak is a stratum of ore one foot thick that will average \$1,700 per ton. This mine is owned wholly by Messrs. McMillon & Harris, who located it in February, 1876. They have 1,500 feet on the ledge, which at many points shows this extremely rich ore in the croppings. They have a five-stamp mill on their mine, which is running on second-grade ore. In asserting their ore they have to reject the richer pieces, these being too near metallic silver to admit of being milled. The foregoing facts we get from parties recently from the mine; the lot of ore, to be seen as above, speaking for itself. It is dirty-looking stuff, presenting a very different appearance from the highly crystallized, sparkling ores from the Silver King, also in Arizona. The Jackson lode can be traced, it is said, for a long distance, as many as 40 different company locations having already been made upon it.

## Items of Interest from the Mines.

We give below items of interest from prominent mines, most of which are collated from letters of the respective Superintendents on file at the offices in this city:

The face of the east shaft, 1400-foot level of the Overman, is showing a very promising formation, and is perfectly dry, the waters having all disappeared.

Last week, Chollar turned out 495 tons of ore, assaying an average of \$21.75 per ton. The ledge in the stope of the Empire (G. V.) is still very small and ground hard.

The upraise from the 100-foot level of the Justice continues to develop fair milling ore as well as the stopes from either end of the same upraise.

The winze from 120-foot level of the Hussey, has shown ore all the way down. The winze has proven a continuous body of ore for the depth of 140 feet, with a better vein of ore at the bottom than in any part of the winze, thereby changing the 230-foot level from what was supposed to be a barren, to a good ore-producing level.

The shaft in the Joe Scates is down 110 feet, the ledge working well.

In the Gila, the progress made last week, three feet in crosscut and four feet in drift, has been very small, owing to the hard nature of the rock in one, and to the time which is consumed in taking out and separating the ore in the other. They have now upon the dump about 30 tons of ore ready for the mill, with a lot unsorted. No stoping has been done yet, as the openings to that part of the mine have been filled with waste which had to be removed before any number of men could be employed.

The ore body in the Leviathan is about seven feet wide, containing many fine streaks of ore.

From the Ophir they are taking out 10 tons of ore daily from stopes on the 1366-foot level, which they are storing in the ore-house. The ore assays have been running down for 10 days previous, which can only be attributed to the ore pinching out.

The ore stopes in the Grand Prize present the usual fine appearance, with no indication of diminishing in either quantity or quality. Both mills are running steadily.

The ore east drift in 1150-foot level of the Justice is in promising vein matter.

The ore operations at the Con. Virginia mine for the week ending on the 3d were as follows:

1200 to 1400-foot levels, tons.....	696
1550-foot level.....	40
1050-foot level.....	2,187

Tons extracted.....2,833

Tons sent to mills.....2,830

The operations at the California mine for the week ending on the 3d were as follows:

1500 and 1550-foot levels, tons.....	1,624
1000-foot level.....	3,121
1050-foot level.....	319

Tons extracted.....5,064

Tons sent to mills.....4,880

It will be seen that the repairs to the main shaft between the 1500 and 1550-foot levels has not diminished the ore production, the total for the previous week being 5,100 tons.

## Heat Underground.

Some of the drifts on the lower levels of several of the Comstock mines are found to be so hot that it is next to impossible for the men to work in them. When they can work it is to great disadvantage, and considerable labor and money is expended by the companies to supply fresh air. In some cases, men can only work a few minutes and then run out to cool off. In the Consolidated Virginia mine, the face of the north drift on the 1750-foot level from the Gould & Curry, near the east wall of the ore vein, is so hot that it is necessary to keep a close, tight box, or cooling room, in close proximity to the workmen, in which the temperature of the air is kept down by compressed air, so that the men may cool off and change every few minutes. Another of these cooling boxes has to be placed at a half-way point in the drift for the use of the men who run the cars in and out.

The Savage incline, also, at a point near the water, is so hot as to be almost beyond human endurance. But for their shirts the skin of the men would be blistered as though by a jet of scalding steam. A man from the mine showed an *Enterprise* reporter a blister on his arm that was nearly as large as a man's hand. This blister was caused by exposing his arm at the bottom of the incline. It is so hot down at the water that in screwing a nut on the end of a bolt one man would be able to do no more than fasten a monkey-wrench upon it before he would have to retreat. Another would then descend and give the wrench two or three turns. One day last week the giraffe got off the track well down the incline, and in trying to replace it one of a small party of men was so overcome by the heat that he fell down in a state of insensibility. His companions carried him from a point between the 1700 and the 1900-foot levels to the 1300-foot level of the Hale and Norcross mine, where he could obtain a mouthful of fresh air. He was still unconscious when he reached the point named. The Hale and Norcross mine is now quite cool, the draft in it having again changed, being once more down the main shaft.



## The Yuba River Levee.

We present herewith a cut representing this structure, a detailed description of which, and the purposes for which it was built, appeared in our issue of the 14th ult. This levee, as therein explained, was thrown up to protect a large body of rich farming land situated along the south side of the Yuba, from threatened inundation by the tailings brought down from the hydraulic mines located along the main stream and its branches; which material had, in former years, covered up wholly or in part some 1,500 acres of similar rich bottoms on the opposite side of the river.

In this cut is exhibited the Yuba, with its inter-communicating sloughs, making its way centrally across the wide expanse of interval; the section of the river here shown reaching from its point of debouchment from the foothills to its junction with Feather river, a distance of about nine miles; also the levee lately constructed, extending also from the foothills to the line of the California and Oregon railroad, which crosses these flat lands on a high embankment. This structure has been located about one-half mile back from the bank of the river, in order to make room for the water during its high stages. It is eight miles long, about 25 feet wide on the bottom and 12 feet on top, with a slope of two to one on the inner or land side and three to one on the water side, as shown by the cross section in the upper right hand corner of the diagram. Its height varies somewhat with the natural inequalities of the surface on which it is located, the top of it being, at most exposed points, five feet above flood line, and everywhere sufficiently above high-water mark to protect the lands behind from any danger of overflow. Through it have been placed at suitable points large iron pipes with gates, for letting out any water that may accumulate in the rear.

The outside slope of the embankment, for a distance of two miles, has been covered with a facing of willow brush to shield it from the action of the water, this section having been built largely of the hydraulic tailings, composed of sand and other loose material. Another mile has been protected for the same purpose, by a substantial brush fence.

The body of land protected by this levee, amounting to about 30,000 acres, all of good quality, is indicated by the parallel lines drawn diagonally across the cut covering the space between the Yuba and Dry creek; the land already overflowed being represented by the horizontal lines adjoining on the north. The dyke on which the railroad runs serves to keep out any back water that might come in from that quarter.

On a portion of the new, or as it is generally designated, the O'Brien levee, the county road has been located, the original dimensions of the embankment having been enlarged for that purpose. This levee will furnish an excellent roadbed across a stretch of country heretofore almost impassable to teams during wet weather. The most useful end subserved by it, however, will be the rescuing of so large a tract of fine agricultural land from the injury that, in its absence, must sooner or later have overtaken it; and not a little praise should be awarded the generous and enterprising miners, to whose efforts this improvement has been mainly due. Towards defraying its cost, very nearly \$50,000, the mine and ditch owners along the Yuba and its tributaries have contributed more than three-fourths, besides giving to it largely their personal attention. Amongst these who in this latter particular have made what, to men with their extensive business engagements, may be considered large sacrifices, are James P. Pierce, James O'Brien and James McManney, of the Smartsville mines. Hamilton Smith Jr. has also contributed freely of his time and professional services toward promoting the enterprise.

By way of correcting an error in our previous account of this work, it should be mentioned that the sum given by Yuba county was but five instead of ten thousand dollars, as therein stated.

THERE are in this city no less than 47 iron foundries, machine shops and boiler factories, employing upwards of 3,000 hands, and expending about \$1,000,000 annually for wages. This is only one class of the various manufacturing industries in San Francisco. It is no more than proper that an annual exhibition should be held in which to display the results of the labor of these mechanics. Other branches of manufacture, of course, help to swell the ranks of the mechanics and artisans among us. Once each year, when the Mechanics' Institute holds its Fair, these men are able to show the people what they have been doing, and show them, also, what improvements they have made in a twelvemonth. It is something which all citizens should encourage in every way possible, because on such industries as these the permanent prosperity of our city depends.

**BULLION SHIPMENTS.**—Since our last issue shipments of bullion from prominent mines have been as follows: Grand Prize, August 2d, \$12,800; Ophir, August 1st, \$6,407; Endowment, August 3d, \$2,590; Northern Belle, July 31st, \$9,272; Arizona, August 1st, \$1,359; Grand Prize, August 5th, \$13,200; Empire, August 2d, \$13,500; Tybe Consolidated, August 2d, \$4,205.64. Total for July, \$79,230. Northern Belle, August 2d, \$8,667.

## Opening Exercises of Twelfth Industrial Exhibition.

According to the published programme, the opening exercises of the present exhibition took place at Baldwin's Theater Tuesday afternoon. The theater was comfortably filled, and some few had the privilege of standing room, the boxes being occupied as well as other parts of the house. It was estimated that about 2,500 were present. Below we give the address of President Huldick, who was listened to with close attention, and his utterance was so distinct as to enable all present to catch every word:

*Ladies, Gentlemen and Members of the Mechanics' Institute.*—We have met here to inaugurate the Twelfth Industrial Exhibition, under the auspices of the Mechanics' Institute, and while we are gathered under the roof of the Industrial Pavilion, the evidence of man's industry and genius, that industry and genius is moving onward in its restless course, and the exhibition is but the taking stock of our industrial affairs at this time in this place.

What criticism of our surroundings of this day could comprehend the whole situation, when there are so many collateral conditions from the outside that can pour on us spontaneously and alter the landscape and every figure in it, or what retrospection can determine with any degree of mathematical certainty or accu-

There is something that strikes me as ludicrous in a man claiming to be an inventor and unit for anything else—a man chasing ideas and shadows, while the substances of life for which he was made, sink before him in the clear stream of economic activity—and dreaming on through life, sustained in the vain hope of revelling in the license (in the language of the times) of a bonanza of invention.

The sooner a man—especially a young man—disabuses himself of that idea and goes to work in the line of legitimate research and individual investigation, the better for him and his fellow men.

And in this he should be encouraged, and facilities for this work should be extended him in every possible way—by free instruction, by lectures, by the brightest and freshest minds; libraries such as the Mechanics' Institute possesses (and which we hope some day to make free); a university such as the State of California can boast of and these Industrial Exhibitions where results are shown in concrete form, and where you will find examples of almost every kind of human ingenuity put in practical form. That little model you may see on the table there, modest and unassuming as its maker, is the result of the most diligent research and careful thoughts of an intelligent mind following a special line of investigation; that piece of silverware, elegantly chased and most beautiful in design, is the result of careful and patient labor and artistic taste, which again are the result of close application to study and instruction. Every article in an industrial exhibition has its moral, but the application of

While the managers endeavor to gather under the vast roof of the exhibition building, the various evidences and samples of the numerous avocations of industrial life, and set before you a good substantial exhibition of the state of the arts on this coast at this day, it is but a proper concession to the cultivated and aesthetic tastes of the numerous visitors, that the substantial food for the minds, should be accompanied by the lighter articles of diet for the senses. Hence we have the fairy-like garden with its grottoes, its flowers and its foliage. The art gallery with a collection of pictures, many of the highest order of merit, and all pleasing; the various fountains spouting streams of clear water, cooling the air by spray and mist therefrom, and the delightful music, led by a master hand, a herald of the evening, delighting the ear and resting the weary brain, and not unmindful of the body's need, when hunger draws one to a savory meal, various refreshments, solid, liquid and gaseous, are supplied by competent and commiserating commissaries.

In the matter of premiums, the Board of Managers have advised with leading exhibitors, and have determined, after due consideration, to award only one grade of first premiums, which premium will be a medal of new design, prepared for this exhibition, or a cash premium which will be paid in sums varying from \$2.50 to \$250.00.

The selection of judges of awards has been a long and difficult work, and the managers have spent a great deal of time and thought in selecting gentlemen who combine competency, integrity and disinterestedness, and who can be induced to serve. This is one of the most embarrassing labors of the Board, and while they believe the names presented will be satisfactory to the exhibitors, the managers will effect changes when they think it desirable, at the request of exhibitors.

All the available exhibiting space is taken and a great many applicants for space have been cut down in the area they desired, and the managers are sorry that they did not build the pavilion by day's work of India rubber, so that it might be expanded; instead of having it constructed by a contractor.

As the commercial importance of San Francisco increases, as its industrial resources are developed and become more varied and diversified, and as its intercourse with other nations will become more extended, the need of permanent exhibition buildings and grounds will be more immediately felt; and as the success of succeeding exhibitions demonstrate the need of such an institution, I am sure that you will join me in hoping that the day is not far distant when, under the auspices of the Mechanics' Institute, an industrial exhibition building with grounds adjacent, will be established here on such a scale as will do credit to this city and the State of California.

As we will have the pleasure of listening to our respected and distinguished fellow citizen, Hon. Horace Davis, who has been chosen to deliver the oration, on behalf of the Board of Managers, I most heartily welcome you to the opening of the Twelfth Industrial Exhibition, held under the auspices of the Mechanics' Institute.

## Art Galleries.

In the older cities of the world collections of paintings and other works of art have been made with great care and expense, and placed in buildings which are open to the public without charge. The influence of such collections on the people at large has been found to be beneficial. They promote a love for the beautiful, and assist in the cultivation of correct taste among those whose station in life precludes the possibility of possessing any art treasures individually.

There are thousands of persons in any large community with latent love for art, who have no opportunity for gratifying their tastes unless those persons whose means permit them to indulge in such things see fit to place their treasures at public disposal occasionally. This may be considered a public duty that the rich man owes society; but, unfortunately, this obligation is not sufficiently well recognized in America. One reason why the Old World excels us in many matters in beauty of design, variety of subject, etc., is that the taste of the artisans has been cultivated by the inspection of works of art and more familiarity with art matters.

The result of such exhibitions is more marked and more widespread than many suppose. It is not only an incentive to painters to excel, but reaches into the various departments of manufacture. It may be recognized in improved architectural designs, varied in character; in ornamentation of iron and wooden structures; and extends from these to the furniture and appliances of dwellings, and the implements in every-day use. In ancient Greece, when a new statue was completed, it was exhibited in the public places, and the occasion made a holiday of by the people. The results of these exhibitions bore fruit among all classes of the people, and the Athenians were renowned everywhere as the most cultivated people in the whole world. They supplied other nations with products unobtainable elsewhere, and their love for the beautiful, studiously cultivated, resulted in immense practical benefit to their nation. Even to this day, the renown of ancient Greece in aesthetic culture still lives among the nations of the world—a result which may be directly traced to a careful cultivation of art.



LEVEE ON YUBA RIVER TO PROTECT FARMING LAND FROM TAILINGS.

racy the future? The experiences of individuals or communities of even the recent past go for but little, for we run into the same follies and repeat the same errors again and again.

The essential progress of the times is made up of trivial improvements in details, which coagulate under the laws of attraction and form the conceivable advance; hence, nothing that is better should be disregarded because insignificant or small, but should be treasured and cared for, as one essential particle of the whole.

All grand ideas and lofty sentiments must have a foundation of truth to build from, so every invention must emanate from invention, and originality goes back to the beginning of things.

But there are periods of time when marked advances seem to be made in some branch of man's industry or human thought. Yet while we speak of Harvey discovering the circulation of the blood in the human system, or Galileo the rotundity of the earth, or Watt the steam engine, or Hargreaves the spinning jenny, or Newton the laws of gravitation, we find that they are the men who, not acting so much from originality of thought as from clearness of perception, blew away the chaff from previous ideas and invention and put in concrete form the spontaneous thoughts of earlier minds in accord with their own, and produced for the world's benefit a condition that could be practically utilized to the wants of man.

Original thought and original invention, like original sin, is hard to fasten on any one man. The difference between thought and invention is, however, that the former must be surrounded by conditions in sympathy with it to be effective, or must be uttered by a bold mind and brave heart, who dares public opinion, while the latter, under almost any circumstances, can be demonstrated to be right or proved to be wrong, and the sooner this is done the better for all concerned.

the whole is, that tangible results of improvement and progress are brought about only by individual sacrifice, by personal investigation and trained thought practically applied.

Considerations of economy, both of time and mental exertion, require that modes of instruction should be reduced to the best form to obtain the highest result with the least sacrifice; and while the aim of public instruction is to bring it to its simplest form and within the capacity of every mind, the bearing that such instruction is to have upon the future avocation of the pupil is rarely considered, hence there is a surplus instruction in many cases and a deficiency in others.

The ambition of parents to have their boys brought up to the profession, has grafted many a withered bud on a promising tree and snipped in the bud many a young genius who would have been more than ordinarily successful in the more modest walks of life.

But in these hard times, empty stomachs and emptier pockets make many a man wish he could shove the plane, lay a brick, or bake a loaf of bread, to keep the wolf from the door of the cabin that shelters his wife and little ones. Within the past year I have had more men than ever before say to me: "If I had only been taught to do some kind of work that I could turn my hand to, I would not be the unfortunate being I am now."

But yet, unfortunate as it is to educate young men for professions already killed to repletion, it is still more unfortunate, it is criminal, to bring up a lad or a girl in idleness. It is the duty of parents to provide that their children should be so educated as to be able to earn their bread, and if parents fail in this particular, I believe it to be the duty of the State; and if these Industrial Exhibitions do ever so little in strengthening the position of industry over the minds of the less thoughtful members of society, they will have accomplished much of their mission.



## Mining Affairs in Idaho.

The Owyhee *Avalanche* says: We have frequently advanced the opinion in these columns that the mines of Idaho Territory are now among the best in the world. With the investment of capital to a reasonable amount and judicious management the correctness of this statement will be made apparent. The rugged character of our mountain country presenting as it does all the external indications of first-class mineral resources, affords abundance of evidence, on a fair trial, that there are magnificent ledges of gold and silver near the surface in every direction. Rich rock is abundant in all our mining districts. The trouble with most prospectors and operators is that they are apt to become discouraged unless they find ore that assays away up into the hundreds. It is well known that in many camps ore that will yield as low as \$10 per ton is worked with profit to all concerned. In this and other sections of Idaho, ore that is worth three, four and five times as much as this is usually cast aside as worthless. If worth less than \$70 or \$80 to the ton the prospector usually abandons his claim under the impression that it will not pay to work the same. If the country around Silver City or Atlanta could possibly have been located near San Francisco we would find that millions of dollars would have been extracted from the earth where only meagre thousands have been taken. Our somewhat isolated position has placed us at a great disadvantage. If experienced men, backed with capital, could come here and see for themselves the extent and volume of these resources, the way would be paved for opening up, by far, the richest mining region on the Pacific coast. Misfortune after misfortune has followed in the wake of past mismanagement.

In this part of the Territory incalculable mischief has been done by sending here, from abroad, so many worthless and incompetent Superintendents to manage the mines. If such a course is persisted in we shall have a repetition of the drawbacks that have resulted so disastrously for us at various times during the past half dozen years. All we ask is a fair and honest development of our mines, and the result will most assuredly be to the advantage of every man who invests a dollar in mining operations in this section of the country. Since the summer season commenced here, and more especially within the past few days, the number of rich claims that have been discovered seems a most marvellous. Prospectors have only to travel a short distance and work a few hours in order to make a rich strike. The discovery of these claims ought to be followed up by energetic labor and the investment of capital. We have all the facilities and conveniences here for carrying on mining operations successfully. Work is not expensive, the climate is comparatively mild, wood is abundant and no inconvenience is experienced from heavy flows of water. There is not to-day a better country in the world for carrying on mining operations than there is right here in Idaho, and the day is not far distant when this Territory will no longer be suffered to remain in the background. There is wealth in abundance here and with energetic men and judicious labor in the process of developing, the country must soon come to the front.

Now that we are in the midst of a season when we ought to be witnessing the progress of active and successful mining operations, it is worthy of note that some of the best and most promising lodes in this country are allowed to remain idle. Conspicuous among the mines in this vicinity that are thus allowed to continue dormant, the Poorman looms up as possessing the best prospects in the entire country. It is a matter of surprise that work has not been resumed on the Poorman long before this. Millions of dollars have been extracted from the ore beds above the seventh level in this mine, and it is the opinion of practical and competent mining men that the indications point to a more promising outlook below that level than has ever been unfolded in this camp at any time previous. Surrounding circumstances, as well as the opinions of practical men, go to confirm this statement. In the vicinity of the Poorman are the rich ledges contiguous to the Empire, Illinois Central, Idlewild and other mines. From the direction of the Belle Peck, in which mine the shaft extends below the present point of operations in the Poorman, there is a rich ore body, which pitches towards the Poorman, leaving no room for doubt as to the existence of a magnificent bonanza below the recent point of operations. There is not an enterprise in this or any other mining district of the Pacific coast that would pay better at the present time than that of sinking in the Poorman. The work can be accomplished at a comparatively trifling cost. The ground is susceptible of being easily worked, and sinking can be accomplished at less than half the expense usually attending such operations in other mines. By sinking a shaft and running levels below in the Poorman, the greatest bonanza ever brought to light in this or any other camp will reward the enterprise and energy of the men who will step to the front and undertake the work. This is no idle supposition, and if the old Poorman company will take advantage of the situation by the investment of a little capital and the sending of such a gentleman here as M. A. Baldwin, Esq., to represent their interests and push forward the work, they will in a few months, at the furthest, find themselves in possession of one of the best paying mines on this coast. No enterprise, under a systematic development, has a more promising outlook,

and Mr. Baldwin, from his past experience in operations on War Eagle mountain, coupled with his knowledge of the fact that a true fissure exists in the Poorman, would be just the man to drive the work forward to a successful termination and secure wealth to the fortunate investors.

## The Ontario Mine.

A correspondent of the Salt Lake *Tribune*, writing from Park City, gives the following description of the Ontario mine: The shaft is now down 100 feet below the 400-ft level. At a depth of 470 feet the ledge was crossed, thus leaving the vein now on the north side of the working shaft. The station has not yet been cut out at the 500-foot level, but in about eight weeks everything will be in readiness to commence sinking the 600-foot.

A small Knowles' pump, lowered down by a windlass, raises the water from the bottom to the tank on the 400-ft station, where a 12-inch Knowles' plunger sends it to the surface. The mine now makes 400 gallons a minute. Should an accident occur to the working pumps, a 10-inch plunger is held in reserve. But, should anything occur to the surface machinery, by which steam could not be supplied the pumps for any length of time, arrangements have been made to hulkhead the water in all the levels at a moment's notice. So closely has this thing been attended to that mud already mixed is placed beside the gates ready to shut the water off tight in a few moments.

As soon as the station at the 500-ft level is completed, a nine-inch plunger, which is now ready, is to be put up, to send the water to the 400-foot tank.

The present shaft is to be sunk to a depth of 600 feet right away. In the meantime work is to be commenced on a new shaft right away. In the meantime work is to be commenced on a new shaft to tap the ledge at a depth of 1,000 feet. The pitch of the ledge is about eight feet in 100. So much for machinery, now for the mine. From the 400-foot station the east level is 700 feet. The west level is 430 feet. That is to say at a depth of 400 feet the ledge is drifted on 1,130 feet in ore, assaying from \$70 to \$200 per ton. There are six stopes started from the east level, not one of which is over 30 feet high. Four hundred feet of the east level never had a pick stuck in it to start a stope. All this, remember, in ore assaying as above. A winze has been started 600 feet from the station to connect with the 300-foot level. On the west level seven stopes have been started, and like those on the east average about 30 feet. The 300-foot level is 1,000 feet on the ledge—600 feet east and 400 feet west of the station.

In the west level six stopes have been started with about 100 feet yet to commence on. In No. 1 shaft, on this level, is about eight feet of clean ore, assaying from \$25 to \$300, and whenever the assays at the mill run low, one man in this stope for a few days can run the battery samples away up. Thus you see that on the 300-foot level we have 1,000 feet of the ledge exposed, with 100-foot block of ground above and the same below to stope out. From the 200-foot level to the surface is nearly worked out, although there is yet ore enough left to make an ordinary individual happy.

The Ontario company has been fortunate, not only in having succeeded by a heavy expenditure in developing the richest mine in the United States but in having in its employ miners. When we say miners, we mean miners, not men who, failing in sheep culture, procure, through cheek or influence, the delightful occupation of squandering other people's money.

**WAKE UP.**—We have recently urged upon all who are interested in the development of the country the importance of "making hay while the sun shines." This section of the country has only been meagerly prospected as yet. Our summers are short and before we are aware of it winter will be upon us again. This city is right in the heart of one of the richest mining districts in the world. There ought not to be an idle man in town at the present time. A little energy in prospecting is certain to open up rich claims, many of which can be found at a distance of a few hundred yards. There is no excuse for any person to remain idle while such an inviting field lies at our very doors. The coming winter will probably be a long and severe one and every person not regularly engaged in some occupation should shoulder his pick now and make a determined effort to solve the grub question and thus help himself out and benefit the country at the same time.—*Owyhee Avalanche*.

**ROBBERS' CLAIM.**—This claim is situated on the Cheyenne river, near Hat creek. It is owned by the "boys" and pans out well. They clean up daily; the last run netted them several thousand, and for a daily clean up it is the best mine in the country. They use flashing powder considerably, and their picks just fit in the pockets of the passengers. Their mining consists principally of dry diggings, and in place of sluice boxes they are furnished by the stage company with treasure boxes, from which they take the gold with powder instead of quicksilver. There are from twelve to sixty now operating on this gulch. On the dump are a number of watches, jewelry, etc. A stampede left here on Saturday evening last, and others have gone down since. They report the prospects for future extremely promising.—*Black Hills Times*.

## The Jicarilla Placers.

This week has been one of considerable excitement in town, owing to the arrival and departure of miners, bound for the new gold fields in the Jicarilla mountains. The richness of these mines has never been questioned by any one who has seen them. No miner, be he sanguine or conservative, has ever prospected in the Jicarilla mountains and said there is no gold, or there is but little gold in them; the reports have been uniformly to the effect that they are very rich. Lack of water has been the great drawback, but the difficulty will be overcome. Parties are going into the mines now who represent sufficient capital to make it a success. The dry washing process has been demonstrated to be a practicable and paying method. But little capital is required in order to procure the necessary machinery and the expenses and profits can be calculated with great certainty beforehand. If this process proves too slow for large companies with abundant money, steps will be taken to bring water into the gold region, either by a ditch or tramway. Either method is feasible.

Here is a country pronounced by the legends of the past and the discoveries of the present to be rich in the precious metals. A vast city was built by the ancient Aztec race near these mines. The ruins of this city still exist and the remains of vast aqueducts for conducting water can be traced for many miles. It was a city supported by the mines and from it the construction of their jewels, ornaments and idols. Whether these legends are true or not, recent explorations indicate that the Aztecs did not exhaust the wealth of this region and that there is sufficient precious metal left to tempt the hardy adventurers.—*Las Vegas Gazette*.

## Cheap Labor in New Mexico.

In New Mexico we have abundance of cheap labor, that which is rarely possessed by new Territories. In most sections which are in process of settlement, laborers for the purpose of doing rough work, building, fencing, digging ditches, mining, freighting, herding sheep and cattle, etc., are not readily secured, and then only at high wages. Here the abolition of peonage threw upon their own resources a large class of people who must make out a subsistence by turning their hand to any kind of work which they can do and at any price they can obtain. They cannot starve and hence must work. They are employed as herders, freighters, miners, and in all the various occupations in a new country requiring rough and unskilled labor. In some occupations in which these laborers have had training they are the best that can be obtained anywhere; in other branches of industry with which they are not so familiar, they are only indifferent workmen. But when they are given employment they are always willing, nay glad to accept it.—*New Mexican*.

**THE LARGEST STATION IN THE WORLD.**—The good city of York, England, says an English exchange, may now boast of having the largest railway station in the world, a hoast which means something in these days of railway extension and architectural improvement. The length of the platform is 1,500 feet, the covered portion of the station 800 feet, the breadth 234 feet and height 50 feet. An idea of its extent may be formed by Londoners or provincials who have passed through the splendid Midland terminus at St. Pancras. The superficial area of the St. Pancras platform is 165,360 feet, and that of the York platform 171,951 feet. It is not a terminal station, but trains will run right through without hacking or shunting. It is situated on a slope rising from the Ouse, and its main entrance looks upon the city walls on the south side through a portico 150 feet by 55 feet.

**NEW REAGENTS FOR FREE MINERAL ACIDS.**—Herr Huber, in the *Pharm. Centralhalle*, translated by the *Polytechnic*, suggests the use of a solution of molybdate of ammonia and ferrocyanide of potassium for the detection of free mineral acids. If a clear yellow solution of these reagents be added to a colorless solution containing salts of alkaline earths with traces of mineral acids (sulphuric, hydrochloric, nitric, phosphoric, arsenic, sulphurous or phosphoric acids), the solution will turn at once to a reddish-yellow color, which approaches more or less to a dark brown as the quality of acid present is greater or less; the turbidity which often occurs in the solution at once disappears in the presence of an excess of alkali. Boracic and arsenous acids give no reaction. These reagents suggested are admirably adapted for volumetrical determination.

**HOT SPRINGS OF OURAY.**—Three miles down from town are the hot springs, which, ere long, will probably be famous, though Ouray has others at town, already utilized for bathing. These park springs deserve special notice. The visitor approaches a large mound, almost grassless, in the center of which is a circular cavity, a score of feet across, while down some six feet lies the steaming surface of the bubbling pool, itself nearly circular and some five or six feet in diameter. A thousand bubbles rise every moment from its clear depth of some dozen feet. The outlet is some twenty feet beyond and below at the foot of the mound where it flows out as a second spring and smaller, and forms a brooklet in which the steaming water gradually cools in outward flow. The pool is so hot for the hand.—*Saguache Chronicle*.

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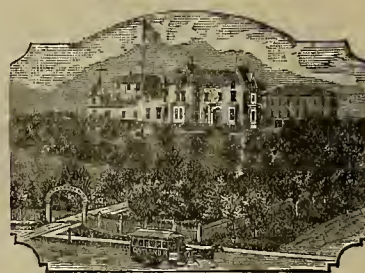
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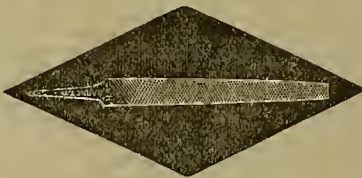
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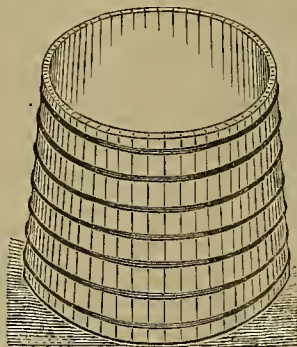
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Continued from page 85.

pushing developments as rapidly as their means will permit. Messrs. McMillan & Harris shipped last week, to San Francisco, 2,200 pounds of first-class ore, for the purpose of having a thorough test made of its value. The Sherman company have also shipped a lot of their first-class ore to California for reduction. Akin & Co. have struck \$2,000 ore on the Democrat, which is the first North Extension of the Stonewall Jackson mine. The mill at McWilliams is still running with satisfactory results. I visited some time since the Brilliant mine, located about four miles north of McWilliams' camp, and is on the same mineral belt as the Richmond and the Chilson mines. From surface indications, this mine bids fair to rival any in the district. As it is now only partially developed, it shows a five-foot ledge, with from 10 to 15 inches of pay ore, that assays from \$200 to \$250 per ton. Dr. Wilson and John G. Gibbons are still doing work on the Centennial, and have been driven from the third shaft by the water, at a depth of 40 feet. It is not probable that they will be able to proceed without a pump. Take it for all and all the mining outlook is brighter every day. Give us good machinery and practical men to work it and we will astonish the world with our silver product.

## Idaho.

EMPIRE.—Owhee Avalanche, Aug. 4: From recent developments in the fourth level of the Empire it is evident that very satisfactory progress is being made with the work. The rock extracted from the vicinity of that level during the past week has all the characteristics of a permanent and strong ledge. It is solid quartz, liberally streaked with gold.

THE Belle Peck is looking finely and turning out plenty of bonanza quartz.

HENRY MYERS, Esq., is making an effort in San Francisco to have work resumed at South Mountain.

Work is progressing very favorably at the Golden Charlot, and Supp. Denon anticipates the most hopeful results from the sinking operations.

THE Potosi continues to improve as the sinking progresses. The rock taken out is liberally streaked with gold, and it is the opinion of practical miners that the Potosi will in a short time take a position as one of the foremost mines in the camp.

THERE is a general hope that work will soon be resumed in the Footman. If the reports are true that a new company has been recently organized in the interests of this mine, it will be reasonable to expect favorable results from such management as will recognize the vast wealth embodied in this property and the importance of developing it.

## Montana.

NEW MINES.—Helena Independent, July 28: Parties have been for over two years opening a placer on one of the tributaries of the Little Boulder. They began work at a precipitous fall in a canyon of the gulch, in order to get ample dump, and have cut and worked their way through the rocks of the canyon for many hundred feet, and have now reached the broad, smooth bed of the creek, where the ground is easily worked and where the gold lays in chunks. The writer got over \$2.50 to one pan of dirt. The grand clean-up this fall will put several thousand dollars of virgin gold in circulation. For the information of pilgrims and others who wish to prospect for placer mines, I will say that the Big and Little Boulders have probably 50 tributaries or gulches emptying into them, that to all outward appearances are as good as the one in which the rich mine above referred to is located. Very many of these creeks and gulches are still in their virgin purity, their soil never having been pierced by the pick of the miner. Some have been scratched over, and wherever gravel has been up-turned, gold has been found. DEER GULCH.—Half a dozen or more companies are working up Deep, and here are located French, Nixon & Co.'s arastra and quartz mines, the only mines of the kind now being worked in this section. The Lady Nixon and Radical lodes are located near the head of Deep gulch, the one being only six inches and the other 15 inches wide, but the ore is good and is paying an average of \$40 per ton. The ore has been sampled up to \$200 per ton, but it pays better to work it all. The ore has to be packed on mules. The first run this season paid a dividend of \$600, sixth of which went to the credit of W. W. Jones, one of the shareholders. A wagon road will soon be built and a battery added to the arastra. These lodes are paying so well that I wonder other owners of quartz in this district do not work them.

A few claims are running up Little Bear and tributaries, but on the Elk side of the mountains but one white man, John Lawrence, is left. They have sold out to Chinamen.

P. BROGAN's big flume in Elk is running, giving employment to a number of men. Childs & McKint, Flemming, Highland and Grant, in Main creek, Ben Winger and Butler, in Day's, and Turner and Kennedy, in Foot Hills, make up the complement of white mine owners in the district.

The placer interests of Bear and Elk are being whittled down and consolidated to a perceptible extent, and efforts to work the quartz lodes should be made before the placers become exhausted. The miners are generally doing well and wages good, \$5 having been the ruling rate.

At Emmetsburg three or four white companies are working and all doing well, W. H. Smith, Butler, Ferguson & Co. having declared a dividend of \$1,300 to the share.

## Signal Service Meteorological Report.

Week Ending July 31, 1877.

HIGHEST AND LOWEST BAROMETER.							
Aug. 1	Aug. 2	Aug. 3	Aug. 4	Aug. 5	Aug. 6	Aug. 7	Aug. 8
30.00	30.02	29.96	29.87	29.93	30.06	30.04	30.07
29.95	29.98	29.93	29.83	29.89	30.02	30.07	30.07
MINIMUM AND MAXIMUM THERMOMETER.							
63	67	69	65	66	62	61	61
54	55	54	53	53	52	53	53
MEAN DAILY HUMIDITY.							
81	73	71	77	78	82	84	84
PREVAILING WIND.							
SW	SWW	W	SW	SWW	SW	SW	SW
WIND—MILES TRAVELED.							
307	349	283	200	291	280	272	272
STATE OF WEATHER.							
Clear	Clear	Clear	Clear	Fair	Fair	Clear	Clear
RAINFALL IN TWENTY-FOUR HOURS.							
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Total rain during the season, from July 1, 1877, 0.02 in.							

## Gold, Legal Tenders, Exchange, Etc.

[Corrected Weekly by SUTRO &amp; CO.]

SAN FRANCISCO, August 8, 3 P. M.  
 LEGAL TENDERS IN S. F., I. A. M. 50¢. SILVER, 51¢.  
 GOLD IN NEW YORK, 105¢.  
 GOLD BARS, \$800/\$800. SILVER BARS, 1015¢ cent. discount.  
 EXCHANGE ON NEW YORK, 1½¢ on London bankers, 48¢; Commercial, 49¢; Paris, five francs \$ dollar; Mexican dollars 14¢.  
 LONDON CONSOLS, 94-95; Bonds, 107½.  
 QUICKSILVER IN S. F., by the Bulk, 1¢ lb. 60¢.

It is reported that Suleiman Pasha, operating south of the Balkans in defense of Adrianople, has gained a decisive victory over the Russians, after four days' fighting.

## Table for Converting Sundry Weights and Measures

Into the Metric System, and the reverse; constructed on the basis of the tables published in the Smithsonian Report for the year 1865, prepared by Henry G. Hanks.

	1	2	3	4	5	6	7	8	9
No. 1.	25.40	50.80	76.20	101.60	127.00	152.40	177.80	203.20	228.60
" 2.	28.32	56.63	84.95	113.27	141.59	169.90	198.22	226.54	254.85
" 3.	61.02	122.05	183.07	244.09	305.12	366.14	427.16	488.19	549.21
" 4.	10.39	32.77	49.16	65.55	81.94	98.32	114.71	131.10	147.48
" 5.	26.417	52.834	79.251	105.668	132.085	158.502	184.919	211.336	237.753
" 6.	3.785	7.571	11.356	15.142	18.927	22.713	26.498	30.283	34.069
" 7.	33.81	67.63	101.44	135.26	169.07	202.88	236.70	270.51	304.32
" 8.	2.557	5.115	7.672	10.230	12.787	15.345	17.902	20.460	23.017
" 9.	2.2046	4.4092	6.6138	8.8184	11.0230	13.2276	15.4322	17.6368	19.8414
" 10.	453.6	907.2	1360.8	1814.4	2268.0	2721.6	3175.2	3628.8	4082.4
" 11.	35.27	70.55	105.82	141.09	176.37	211.64	246.92	282.19	317.46
" 12.	28.35	56.70	85.05	113.40	141.75	170.10	198.45	226.80	255.15
" 13.	32.160	64.320	96.480	128.640	160.799	192.959	225.119	257.279	289.439
" 14.	81.104	162.208	243.312	324.416	405.520	486.624	567.728	648.832	729.936
" 15.	15.432	30.864	46.296	61.728	77.160	92.592	108.024	123.456	138.888
" 16.	0.0649	0.1298	0.1947	0.2596	0.3245	0.3894	0.4543	0.5192	0.5841

1. Inches to millimeters.  
 2. Cubic feet to liters.  
 3. Liters to cubic inches.  
 4. Cubic inches to cubic centimeters.  
 5. Hectoliters to wine gallons.  
 6. Wine gallons to liters.  
 7. Liters to fluid ounces.  
 8. Fluid ounces to centiliters.  
 9. Kilograms to avoirdupois pounds.  
 10. Avoirdupois pounds to grams.  
 11. Kilograms to avoirdupois ounces.  
 12. Avoirdupois ounces to grams.  
 13. Kilograms to Troy ounces.  
 14. Troy ounces to grams.  
 15. Grams to grains.  
 16. Grains to grams.

The above table will be found to meet all the requirements of the assayer and chemist. The following example will explain its use. Suppose the capacity of a tank or cistern is found by measurement to be 82 cubic feet, and the number of liters is required. Refer to table No. 2, and find that 8 cubic feet = 226.54 liters. 80 cubic feet will be ten times as much. Therefore:

80 cubic feet =	2265.40 liters.
2 cubic feet =	56.63 liters.
82 cubic feet =	2322.03 liters.

## An Index of Our Manufacturing Status.

In a large city like San Francisco, an exhibition like that of the Mechanics' Institute serves as an index of its manufacturing prosperity, and as this city represents the State in this matter, it also gives an indication of California's manufacturing status.

It is a recognized fact that the true progress of any new country may be measured by the state of its manufacturing and agricultural industries. Among us mining may be added to the list, but a mere exhibition of ores and mineral products can hardly indicate the condition of this latter industry. It is somewhat out of the line of the Mechanics' Fair to make any complete agricultural display, as the State Agricultural Society takes care of this department at their Fair at Sacramento.

It is to the mechanics, therefore, that we look to give us some practical illustration of our manufacturing advancement, so as to illustrate in the best manner, our growth and progress in material resources. The managers of the Institute furnish a fine commodious building with all the conveniences, and gather the citizens daily and nightly to examine what is shown. It only falls on the mechanics and manufacturers to exhibit the results of their handiwork and skill, and give the people an opportunity to examine them in detail.

The managers of the Fair deserve the thanks of the community for affording this opportunity to both the mechanics and the lookers-on, as the impression made by these exhibitions is of great benefit to the city and State. We need never fear that there will be lack of objects of interest to examine. New designs are being constantly made, new inventions brought forward, and new branches of industry inaugurated in our midst. There is no way of bringing these things so prominently before the people better than showing them the practical results accomplished. Men may pass listlessly over any statement of results in figures, but they cannot ignore results when they see before them the articles manufactured, and are able to judge for themselves of the skill of the artisans who made them.

Such practical results exercise an influence, also, on the capitalists in our midst. When they see that others have been successful in their manufacturing undertakings, they are apt to turn their attention in that direction. A multiplication of such industries gives employment to laboring men, helps us to an increase in a steady and desirable class of population, gives an increase in trade, and is advantageous in every way. It is for these reasons that such exhibitions should be fostered by all classes of the community, and every assistance should be given to make them entirely successful.

PROFESSOR RILEY, of the United States Entomological Commission, made a resume of the labors of that body recently in the far-west, dwelling on the Rocky Mountain locust and grasshopper plague. In summing up his observations he says: "There is very little danger of injury from fall swarms of these insects from the northwest, unless they come from the Black Hills country. There remains a chance of swarms from the western parks and plateaus or from those of Utah, but I have good reason for believing that they will prove no more injurious than the swarms which have been passing on for several days, since I have been in the State of Colorado, from western hatching grounds. 'The prevailing wet weather,' he says, 'has destroyed the insects to a great degree, and has been more instrumental than any other cause in destroying the locust.'

J. E. DALEY, a stockbroker, was shot on Montgomery street, this city, on Tuesday, by L. H. Hanks, Consul for Guatemala, Daley dying an hour afterwards. Hanks afterward committed suicide in prison, shooting himself with a musket left carelessly in the corridor.

## General News Items.

SEVERAL incendiary fires are reported in the interior towns.

A DISASTROUS fire occurred at Olympia, W. T., on the 8th inst.

THE Czar has issued a ukase, ordering a levy of 188,600 of the Landwehr.

EX-PRESIDENT GRANT and party arrived at Bellagio, Italy, Sunday.

MAJOR JOHN COOK, a pioneer of Santa Clara valley, died at San Jose Friday.

HEAVY rains fell in Oregon Friday, which it is feared will damage the grain crop of the State.

PHILIP HARTMAN was instantly killed near Tyrone Mills, Sonoma county, Thursday, by a falling tree.

GENERAL SHERMAN says he is much impressed with the value of the country on the Upper Yellowstone.

THE convention between England and Egypt for the suppression of the slave trade has been signed.

SIR JAMES DOUGLAS, founder of Victoria, British Columbia, and the first Governor of the colony, is dead.

JOHN E. DALY was shot in this city, this week, by Leslie C. Hanks, who afterwards committed suicide in the city prison.

EPHRAIM WHITE and George Rugg were arrested at Marysville Friday, charged with robbing the Downieville stage on Tuesday last.

WILLIAM B. OGDEN, who was the first Mayor of Chicago, and the first President of the Union Pacific Railroad Company, died in New York Friday, aged 72.

FURTHER reports of Russian cruelties continue to be circulated. The Bulgarians, excited by the Russian example, are committing the greatest excesses.

PRESIDENT HAYES has issued an order prohibiting the sale of arms or ammunition to Indians, and revoking all licenses to trade with them in such articles.

A large fire occurred on the water front of this city on Wednesday night. An area of over two blocks was burned over, but the loss was only between \$200,000 and \$300,000.

MOSES A. WHEELLOCK, Chairman of the New York Stock Exchange, has failed on his Western Union contracts. Wheelock has been connected with the Exchange for over 30 years, and has been an officer of the Board for 24 years.

A DASTARDLY outrage was committed on Tuesday at the New York Aquarium. Many of the most valuable and rare fishes were poisoned by persons unknown. It is impossible to replace some of the varieties.

A HAVANA letter records a number of disastrous business failures, with increasing commercial and financial trouble. General Jovelar has been relieved from command and General Blanco appointed. He will arrive in a few weeks. Sick and wounded soldiers are constantly arriving, and hospital room is taxed to the utmost.

A GREEN BAY, Wisconsin, special says: The village of Eaton, Brown county, Wisconsin, has been totally destroyed by fire. The forest has been on fire for weeks, the fire extending many miles in every direction, destroying many million feet of timber and thousands of dollars in other property. Some 25 families were burned out in Eaton, losing everything they possessed. One family is said to have perished in the flames, and four other families are missing. Great suffering exists among the homeless people.

## PATENTS AND INVENTIONS.

## A Weekly List of U. S. Patents Issued to Pacific Coast Inventors.

[FROM OFFICIAL REPORTS FOR THE MINING AND SCIENTIFIC PRESS, DEWEY & CO., PUBLISHERS AND U. S. AND FOREIGN PATENT AGENTS.]

By Special Dispatch, Dated Washington, D. C., July 24th, 1877.

WEEK ENDING JULY 17th, 1877.

103,051. WOOD PAVEMENTS.—Henry M. Stow, S. F.  
 103,074. PIPE COUPLING.—Rufus H. Moss, Salem, Oregon.  
 103,182. SAW SET AND FILE GUIDE.—Henry C. Root, Virginia City, Nev.  
 103,291. STREET RAILROAD.—William H. Stow, Chicago, Ill., and Henry M. Stow, S. F., Cal.

REISSUE.

7,794. SELF-DISCHARGING POLYMERIZING BARREL FOR ORES.—Almarin B. Paul, S. F.

TRADE MARKS.

4,847. } REFINED PETROLEUM.—Haas Brothers, S. F.  
 4,848. }

FOR WEEK ENDING JULY 24th.

103,319. FEEDERS FOR THRESHING MACHINES.—Ethelbert J. Clanton, Woodland, Cal.  
 103,331. WOOD-WORKING MACHINES.—Charles J. Hardee, S. F.  
 103,333. HOISTING APPARATUS.—William Hawkins, S. F.  
 103,346. COPYING PRESS.—James A. Powlett, S. F., assignor to J. P. Hopkins.  
 103,372. BRANDING STAMPS FOR MAKING CANDLES.—Isidor Lavenson, S. F.  
 103,375. REFRIGERATING BY MEANS OF AMMONIA.—Robert H. Lucas, S. F.  
 103,378. PORTABLE STEAM BOILERS.—William R. Michener, S. F.  
 103,384. SNOW PLOWS.—George Royal, Truckee, Cal.  
 103,404. COPYING PRESS.—Elias Gill, S. F.  
 103,432. FILTERING AND COOLING APPARATUS.—Josiah W. Webb, S. F.  
 103,457. STAGE SCENERY AND OPERATING MECHANISMS.—Henry F. Parsons, Los Angeles, Cal., assignor to David R. Morse, New York, N. Y.  
 103,402. INDICATORS FOR MINING SHIFTS.—Calvin O. Richardson, S. F.  
 103,483. BLASTING CARTRIDGES.—Prudencio Castellanos, S. F.  
 103,485. DEVICES FOR EXPLODING MINING POWER.—Prudencio Castellanos, S. F.  
 103,489. FIRE ESCAPES.—Ira D. Cross, Reno, Nev.

## Notices of Recent Patents.

Among the patents recently obtained through Dewey & Co.'s SCIENTIFIC PRESS American and Foreign Patent Agency, the following are worthy of mention:

PORTABLE BOILER.—Wm. R. Michener, S. F. This invention relates to certain improvements in the construction of boilers, and more especially that class of boilers which are known as portable or field boilers, and which are constructed with a single large flue serving as a fireplace and extending through the length of the boiler, while small return tubes upon each side carry the products of combustion to the chimney. This improvement consists in making the large flue a segment of a circle, and riveting its edges to the lower part of the cylindrical main shell of the boiler, so that at the bottom this main shell serves as a bottom both to the boiler and to the tube. A portion of the main shell is cut away where the fire grates are placed, so as to allow an ash pan to be set beneath the grates; and this ash pan may be surrounded by a water chamber, which connects with the water space in the boiler. A shaft or axle is firmly secured across the end, which is cut away to receive the grates, so as to serve as a stay, and counteract any weakening arising from said cutting away.

WOOD-WORKING MACHINE.—Charles J. Hardee, San Francisco. The object of this wood-working machine is to do that class of work which requires a shifting tool, or, in other words, in which the tool requires frequent adjustment in order to obviate a frequent shifting of the board or other piece of timber to be finished. The machine is especially adapted for doing that class of work which is known among stair-builders as "housing," the same being a groove or grooves in the stringer board, which is secured against the wall alongside of stairs, in which grooves the ends of the risers and threads of stairs are fitted in order to conceal the joint. The machine consists of a swinging frame, which is provided with a track or tracks, upon which a carriage is arranged to travel and be adjusted. This carriage carries the grooving or other cutting tool. It also consists of an improved table for holding the work, which can be adjusted with great nicety to the position of the tool on the carriage. By adjusting the swinging frame and table, the operation can form any desired figure or pattern in grooving, channeling, rabbeting or other similar work. It is a very important tool in doing such work as is necessary in fitting angular and irregular joints.

CANDLE-BRANDING MACHINE.—Isidor Lavenson, San Francisco. This invention relates to an improved machine for imprinting the name of the manufacturer or other brand or mark, upon the candles. The improved machine is so constructed that the operation is rendered quite simple, so that the candles can be handled and branded with great celerity.

WOODWARD'S GARDENS has the following new attractions: The buffalo chase; large whale skeleton; new museum; improvements in the zoological department, besides the other features which have made it popular.







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**PACIFIC  
ROLLING MILL COMPANY,**  
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Established for the Manufacture of

**RAILROAD AND OTHER IRON**

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Embracing ALL SIZES of

Steamboat Shafts, Cranks, Piston and Connecting Rods, Car and Locomotive Axles and Frames,

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Directors:

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Wm. Norris, Wm. H. Taylor, J. B. Haggin,  
James D. Walker.

WM. H. TAYLOR.....President  
JOSEPH MOORE.....Vice-President and Superintendent  
LEWIS R. MEAD.....Secretary

THOS. PENDERGAST.

HENRY S. SMITH

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**Risdon Iron and Locomotive Works**

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Are prepared to make SHEET IRON AND ASPHALTUM PIPE, of any size and for any pressure, and construct to lay the same where wanted, guaranteeing a perfect working pipe with the least amount of material.

Standard sizes of Railroad Car Wheels, with special patterns for Mining Cars. These small wheels are made of the best Car Wheel Iron, properly chilled, and can be fitted up with the improved axle and box—introduced by this company, and guaranteed to outlast any other wheels made in this State.

All kinds of Machinery made and repaired.

JOSEPH MOORE, Superintendent.

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PRACTICAL BOILER MAKERS,

Marine, Stationary and Portable Boilers, Smoke Stacks, Hydraulic Pipe, Oil or Water Tanks, Ore and Water Buckets, Gasometers, Girders, Bridges and Iron Ship Building.

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**Miners' Foundry and Machine Works,**

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First Street, bet. Howard and Folsom, San Francisco

Machinery and Castings of all kinds.

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ENGINES, BOILERS, MARINE AND STATIONARY. PUMPING, HOISTING AND MINING MACHINERY INCLUDING BATTERIES, AMALGAMATING PANS AND SETTLERS, CONCENTRATORS, ORE FEEDERS, CRUSHING ROLLS AND ROCK BREAKERS. ALSO, WATER JACKET SMELTING FURNACES, FOR REDUCING LEAD, SILVER AND COPPER ORES, QUICKSILVER FURNACES, RETORTS AND CONDENSERS, ROASTING AND CHLORIDIZING FURNACES, SUGAR MILL MACHINERY, WATER WHEELS, ETC., ALL OF THE LATEST AND MOST IMPROVED CONSTRUCTION.

Agents for the Allen Engine Governor, Cook's Boiler Feeder and Heater, Buckminster Rock Drills and Air Compressors, Wheeler's Ore Breaker, Etc.

GEO. W. FOGG, Supt.

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Wharf and Bridge Bolts, Railroad Trestle Work, Car Frames and Bolts, Machine Bolts, Set Screws and Tap Bolts, Lag or Coach Screws.

**ALL STYLES OF FANCY HEAD BOLTS.**  
HOT AND COLD PRESSED HEXAGONAL AND SQUARE NUTS, WASHERS, BOLT ENDS, TURNBUCKLES, ETC., ETC.

13, 15 & 17 Drumm St., near California,

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**THOMPSON BROTHERS,  
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Light and Heavy Castings of Every Description Manufactured.

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The Only Illuminating Tile Manufactured for Lighting Cellars, Basements and Dark Rooms which provides proper ventilation for such places.

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All kinds of Brass, Composition, Zinc, and Babbitt Metal Castings, Brass Ship Work of all kinds, Spikes, Sheathing Nails, Rudder Braces, Hinges, Ship and Steamboat Bells and Gongs of superior tone. All kinds of Cocks and Valves, Hydraulic Pipes and Nozzles, and Hose Couplings and Connections of all sizes and patterns, furnished with dispatch.

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Wherever introduced, because it can be run with less power, labor and repairs, and do more work than any other Drill in the market. It has but few parts, is easily handled, being light, and has AUTOMATIC FEED, which saves labor. WE ASK FOR TRIAL AGAINST ANY COMPETITOR. For particular information regarding Drills or Air Compressors, send for circular to

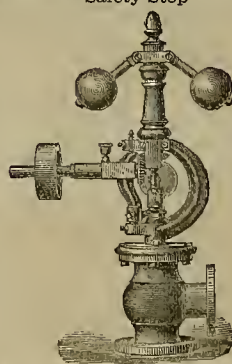
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Guaranteed to Chloridize from 85 to 95 per cent. of any gold or silver ores that are not more profitable for smelting. Will also desulphurize ores and put them in proper shape for working in cupola furnaces.

**Cost of Roasting and Chloridizing 20 Tons in 24 Hours by this Process:**

One man.....	\$ 4 00
One man.....	3 00
Wood—24 Cords at \$3 per cord.....	5 25
Salt—1,600 lbs at 2½ cents.....	40 00

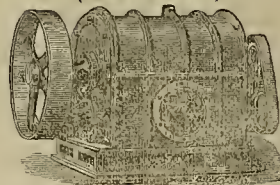
Cost of 20 tons.....	\$52 25
Cost of one ton.....	2 61½

In a furnace of three or four times this capacity the cost is decreased by 20 per cent.

The furnace is now working successfully at the Poe Consolidated Co.'s mines, in Peavine District, Nev., and at the Exchequer mill, Alpine Co., Cal. For further information, apply to

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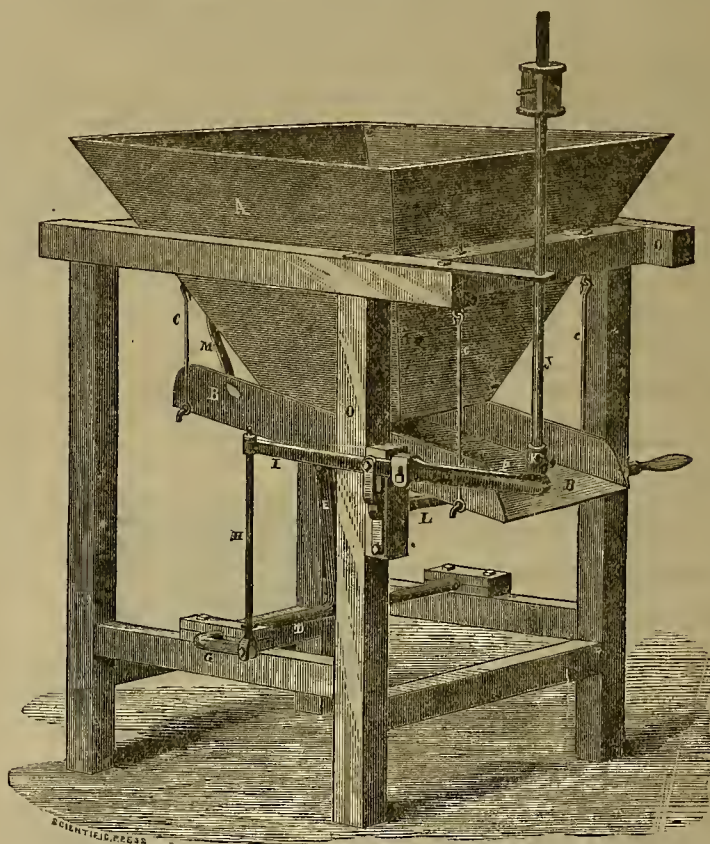
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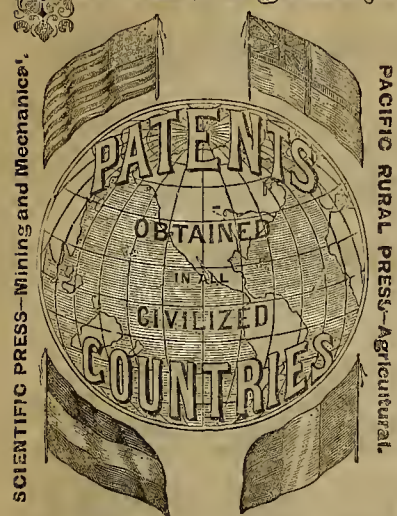
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Yours truly,  
JAMES ROOT.

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SAN FRANCISCO, SATURDAY, AUGUST 18, 1877.

VOLUME XXXV.  
Number 7.

## The Mariposa Estate.

Work on the tunnel on the Mariposa estate, from which so much was expected, has been stopped, because the suit brought by Joseph A. Donohoe against the company, for foreclosure on account of non-payment of a debt of some \$300,000, unsettled for some years, has resulted in the Mariposa estate or Fromont grant being taken possession of by the authority of the Fourth District Court, in whose custody it will remain pending the legal proceedings. The debt was payable in instalments, only two of which have been paid, and the last one fell due on the 1st inst., but was unpaid. A suit for foreclosure was commenced on the 6th inst., and the property has been taken possession of by the court. According to the Mariposa *Gazette*, an officer of the court was appointed to go there and execute its orders in the premises. The person selected for and charged with this duty was William Thorpe, formerly superintendent of the company. He was, we understand, recommended for the position by the president of the company and the mortgagee, and thereupon appointed and empowered by the court to act as receiver and take charge of the lands, mines, machinery, buildings, etc., for the court, reporting to it and acting under its sole control. The receiver arrived on the 9th, and is now there. Arrangements have been perfected by which the debts of the company, due to the clerks, mechanics, workmen, will be paid in full; also, many debts of the company due to citizens of Mariposa county will be paid without delay. Subsequently to the foreclosure a number of other suits were begun against the company, attachments were issued, and the remaining property has been looted upon and is now in charge of the Sheriff.

The stoppage of work on the tunnel, on which nothing further can be done under the orders of the court, throws out of employment a number of deserving men, who will have to look elsewhere until operations on the new tunnel are again commenced.

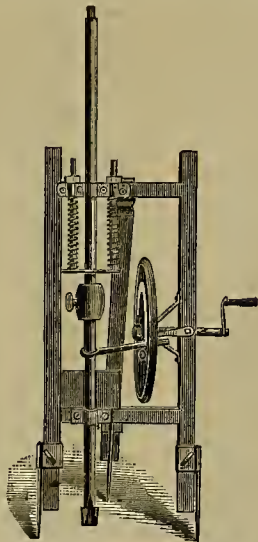
## Loss in Transporting Ore.

It is impossible for any one not familiar with mining matters to conceive how difficult it is to obtain all there is in ore, even when the greatest precautions possible are taken. Without referring to the metallurgical operations at all, where the principal loss occurs, the mere handling and transportation of the ore from mine to mill entails a loss in proportion to the richness of the rock. The roads over which the ore is transported in the mining districts contain more or less precious metals, and the dust of the streets would give pretty good assays in gold or silver, as the case may be. Lumps of ore fall from the wagons, are crushed by passing wheels, and scattered about by the horses' feet and the winds, so that in time such thoroughfares accumulate considerable metal.

The sides of the railroad tracks, also, in mining districts, are receptacles for precious metals. Even the dust which blows from such ore as comes from the bonanza occasioned so much waste that it was found advisable to wet the ore down before sending it over the road in the cars. This is now done before the trains leave. Where the ore has to be put through a furnace, however, as at Eureka, it would not pay to wet it, as the moisture, which would have to be expelled in the furnace, would cause more loss in fuel than would be saved by sprinkling. In that camp, also, the loss referred to occurs, and the *Sentinel* states that the Ruby Hill railroad is literally ballasted with silver ore. The daily passage of ore trains over the road and the constant jar scatters a portion of the load out of the cars and alongside of the track for the entire distance. Assays have been made of the earth in several places, and they have run as high as \$50 per ton. The work of gathering it up would cost more than it is worth, and there is no way of stopping the waste. This is one of the sources of loss against which it is difficult to guard, and only shows that the miners have hard work to save what there is in the ore after they find the ore and get it out.

## New Hand-Power Rock Drill.

The accompanying engraving represents a novel method of operating hand drills, invented by A. J. Mershon, of Warsaw, Indiana, which would be found useful in small mines on this coast. The mechanism consists of a strong frame, through boxes in the cross-beams of which the drill slides. One end of a short shaft is journaled into the frame and the other in brackets. On the inner end of the shaft is a disk in which there is an arch-shaped slot. In the slot is journaled a roller which is concave in the direction of its length. An arm projects from a ring which encircles the drill and passes through the slot in the disk. The brackets that support the inner end of the shaft are of such size as to come wholly within the slot, so as to allow of the rotary motion of the arm. A block is secured to the lower cross timber to receive the ring of the arm, at the lower portion of its stroke. The drill point is enlarged and made V-shaped, so that the sharp edges of the V trim the sides of the hole. Two spiral springs are suspended directly under the upper cross-piece. These springs are compressed by a fixed collar on the bar,



Mershon's Hand-Power Rock-Drill.

when the latter is raised. The disk shaft is turned by an ordinary crank, or it may be connected with any convenient motor.

The mode of operation is as follows: As the disk is rotated, the arm is carried upwards by the roller; and as the arm clamps the drill rod on being raised, it carries the latter with it, compressing the springs, and at the same time turning the rod through a part of a revolution. When the roller comes directly over the shaft, the arm is released, and the drill rod and arm fall together. As the ring of the arm strikes the block the drill rod is entirely released, and is thus allowed to make a full blow upon the rock, the effect of which is increased by the expansion of the springs. Each time that the drill is raised, it is automatically turned, so that its cutting edge is constantly being shifted to new points in the rock.

These drills are simple in operation, and being without cog-wheels and gearing are durable and not liable to get out of order. Any miner can see how they could be applied. They are more especially useful in quarries, cuts, etc., but may be used to advantage in sinking small shafts, winzes, etc.

The Belcher company had 226 men on its July pay-roll, and paid out to them a total of \$25,345.50. Of this amount \$5,838 was paid out for account of the Belcher and Crown Point combination shaft, of which the Belcher company pays two-thirds and the Crown Point one-third.

CALIFORNIA produced, in 1876, over 7,500 flasks of quicksilver.

## Bed-Rock Flumes.

Bed-rock flumes are usually expensive undertakings, and seldom commenced unless there is a very good prospect of being repaid. Shafts are sunk and tunnels run on ventures, but bed-rock flumes are designed to tap some known gravel channel which cannot be worked advantageously without one. During the time they are being run, of course, the money all goes out, and there is generally no prospect of getting any back until it is completed. One flume of this kind will often hold up a whole camp or district, while without it there would be no outlet for the gravel, and no work on a large scale could be done. Flumes of this kind are peculiarly Californian, as it is mainly in this State that the auriferous gravel banks occur.

In Montana, however, where a great deal of placer mining has been and is being done, the miners work the ground on the same system as is in vogue here. In Last Chance gulch, an extensive bed-rock flume, which was commenced in June, 1875, is being run. Some 6,000 feet of this flume have been cut, and it is not expected to complete the whole 9,000 feet before the mining season of 1878. Its dimensions are three feet deep and three wide. The lower portion is upon a grade of two and a half inches to the rod, and the upper portion three inches. The head of the flume is about nine feet in the bed-rock, or rather below what was called bed-rock when the gulch was drifted out, but which



Wait's Horse Feeder.

in reality is but a bed of gravel which contains but little gold. It is not improbable, however, that when the bed-rock proper is reached an extremely rich deposit of gold will be found. The work upon this flume has been of the most thorough character, and it is certainly one of the best in the Territory. The editor of the *Helena Independent*, who visited the flume recently when the water had been turned off to admit of some slight repairs to the pavement, had a good opportunity to see how well it did its work. Even with the light grade there was not even an ordinary wagon-load of gravel and boulders in the entire 6,000 feet of its length. The gravel is very heavy and all rock weighing less than 10 or 15 pounds are put through. When completed it will be 9,000 feet in length. The superintendent believes this can be accomplished by the close of the season of 1878. It will open up to mining a space of good ground a mile in length by an average width of half a mile. This ground will give employment to a couple of hundred men for eight or ten years; and the constant employment of this force of men, in addition to those now at work, will be of considerable benefit to the business men of Helena. Mr. Chessman is entitled to a good deal of credit for the enterprise and energy he has shown in undertaking and rushing forward a work that promises to be of so much benefit to the public.

ACCORDING to the *Yolo Mail*, Lloyd Tevis, a large owner in the Southern Pacific railroad, has obtained control of the Vaca Valley railroad.

## The Coming Scientists.

Some of the members of the distinguished party of scientists, who left the East a short time since, and who have been making special scientific studies in the States and Territories east of the mountains, are expected here in a day or two. This party was composed of Sir Joseph D. Hooker and Lieut. Gen'l Richard Strachey, of England; Prof. Asa Gray, of Harvard University; Prof. Joseph Leidy, of Philadelphia; Prof. Hayden, of Washington, and Dr. R. H. Lamborn, of Philadelphia. Mrs. Gray and Mrs. Strachey also accompanied the party. These eminent specialists have made extended examinations and notes in Kansas, Colorado and Wyoming, and are now making examinations in Nevada, from where they will in a day or two start for San Francisco. It is their intention to visit as many important localities in this State as their time will permit. Sir Joseph D. Hooker is one of the most eminent botanists in Europe, and is the Director of the Royal Botanical Gardens at Kew. He is directing special attention to the tree vegetation of this continent, and from his known eminence as a botanist, most valuable information on the important subject of our great forests may be looked for. Dr. Hooker designs making a report on this subject, of which our Government will have the benefit.

Prof. Gray, so well known as our most distinguished American botanist, accompanies the party, and is laboring in conjunction with Dr. Hooker. They have already collected over 600 species of plants, and have noted on the spot all features connected with their growth, locality, geographical distribution, altitude, etc. General Richard Strachey, of the Royal Engineers, has been in charge of the great irrigation works of British India, and has also given much attention and study to the construction of railways in that country, especially the narrow-gauge roads in the Himalaya mountains. General Strachey took the deepest interest in our method of constructing and working railways—pronouncing them most completely successful, and, in many instances, as exhibiting bold and highly skilled engineering. The General evinced much interest in the matter of irrigation in this country, and expressed the belief that the waters of nearly all our great streams could be readily utilized to enrich great tracts of our country, which now lie waste for want of water. Although General Strachey's observations were extensive, as far as he went, it is unfortunate that information, both of a private and official nature, necessitated his return to England from Utah. His recall is much to be regretted, as a wide and important field, both for railway construction and irrigation, is to be found west of the Rocky mountains.

Prof. Gray and Dr. Hooker will continue their labors to this coast. They hope to visit all points of interest in California. The material and information that will be collected, by men of such wide experience and thorough knowledge, will form a most interesting and important report, which will be submitted to our Government through Prof. Hayden's geological survey. Prof. Leidy, of Philadelphia, is investigating the region in the neighborhood of Fort Bridger, which is known to be rich in fossil remains. Prof. Leidy is especially interested in the investigation of microscopic forms, an extensive work on which he is now preparing for publication by the survey under Prof. Hayden.

## Wait's Horse Feeder.

One of the novelties in the fair is a great improvement in the manner of feeding horses in the street. This is Wait's nose bag, out of which we herewith give. It is a canvas bag perforated with holes near the top to give the horse air, and fitting closely around the muzzle by means of an elastic flange. The strap over the head is supplemented by springs so arranged that as the horse eats out the grain, the springs come in play and raise the feed up closer, thereby enabling the animal to eat the last grain out without any of the tossing around incident to the use of other feeding arrangements. The elastic flange prevents his spilling any of his feed, and chopped feed can be fed as well as whole grain. In the pavilion it may be found beyond the carriage department.



## CORRESPONDENCE.

### French Gulch and Deadwood Mines.

EDITORS PRESS:—As I seldom see anything from this section in your paper, I thought a few lines might be of interest, as we have quite a little mining excitement over quartz at the present time, although discovered last fall. Last October, Mr. Balleau, a stranger in this locality, struck very rich quartz on Deadwood, a small stream which heads with French Gulch, in the divide between Trinity river and Clark creek, and empties into Trinity river. It is about six miles from here. Muncy & Balleau prospected during the winter, and with a horse arastra and hand mortar, took out several thousand dollars. Within the past four months many claims have been discovered, and a one-fourth interest in the Muncy & Balleau claim has been sold for \$1,500; and a sale was made last week of "discovery" for \$5,000 cash, and but very little work done on the claim. The ledge is only 15 inches wide, but it is said \$3 per pound has frequently been obtained. There have been five or six claims surveyed with a view of entering. Mr. George Kline struck quartz in connection with placer mining several years ago, and for two years past has been running an arastra whenever he had water, and making from \$250 to \$600 per month. This is, perhaps, two miles from the first Balleau discovery, and is all on the Trinity side of the divide. The prospect has been traced into Sbaasta county. Entirely disconnected with these discoveries, Mr. Kern discovered last fall, in this county, at the head of French Gulch, and not far from the old Sbaa ledge, a very rich ledge. He and Mr. Shea have put up an arastra and have been making from \$700 to \$1,200 per month since. There are several arastras being put up on the Deadwood, and when they are running I expect to hear of good pay being taken out.

The Washington Quartz and Placer Gold and Silver mining company's claim is not to exceed two miles from the Kern & Sbaa mine. The Washington has not been running for several years. A great amount of sulphurets developed in the mine, and the owners could not make it pay. Being poor men, they could not afford to prospect or experiment.

They have a 22-stamp mill, and first commenced operations in 1852. The company have taken out over half a million dollars. If parties having money could be induced to take hold of it, there is no doubt but that it can be made to pay again.

The placer mines in this county are pretty well worked out. Trinity county, however, has much rich ground yet, but lacks water. The past winter they done but little for want of rain. I must close. More anon. W.

### Mono County Mines.

The editor of the *Iuyo Independent* has been at Benton, Mono county, and publishes the following:

Geo. E. Webber, Superintendent of the Comanche mining company, has just returned from San Francisco, where he has purchased a heavy engine, pump and pipes with which to sink the shaft 250 deeper, making a total depth of 1,000 feet. That done, enough ore can be stowed out to keep the mill running steadily for two years thereafter. Owing to the vast quantity of water now coming into the mine, filling it some 40 feet above the 750-foot level, it has been found quite out of the question to keep the mill supplied with ore, though we are told there is an abundance of it, and of the richest quality, in the mine. For some weeks past the mill has been kept running on tailings, which are made to yield about \$16 per ton, therefore a good profit. The batteries were started on ore last Monday, but will probably not find continuous work until the big pump is in operation.

C. H. Aaron, the first to successfully amalgamate Benton ores, has just been placed in charge of the Diana mill. This mill has an abundance of very rich ores on the dump at the mill, and plenty more in sight in the mine, which is down some 500 feet and perfectly dry. As depth was attained in this (the Diana) mine, and also the Kerrick, belonging to the Comanche, the ores grew constantly more and more difficult to amalgamate. Heretofore, on surface ores, the Aaron process was equal to a saving of from 90% to 94%. Toward the last, however, scarcely anything could be saved, so that thousands of dollars were every week run away in the tailings. Mr. Aaron, whose experience and judgment are considered unequalled as regards this particular class of ores, was induced to try his hand as above stated. After three days' run he came to the conclusion that it would be impossible to make a satisfactory success in amalgamating these deep ores without previous roasting, therefore it is very likely milling operations will have to be suspended until a roaster can be built, which, we suppose, will require three or four months' time. With ordinarily successful amalgamating, so rich and plentiful are their ores, this five-stamp mill is expected to turn out well on to \$30,000 in silver bullion per month.

Tregemho & Thomas have been running a drain tunnel into the Yellow Jacket ledge, and

will soon have it completed and re-open the Illinois, a mine which in 1872 produced quantities of ore of extraordinary richness, but upon which no work has been done on account of water, now to be removed by means of this tunnel.

Near this is the Tower mine, belonging to Tregemho and the Hightower estate. This is also considered a first-class mine, but, like the Illinois, so much troubled with water nothing further can be done in getting out ore until drained by pumping, for which purpose heavy steam machinery is now on the ground, and will be put in place as rapidly as possible after the return of Superintendent John Howell, expected from San Francisco early this week.

Albert Mack has been disappointed in his hopes of his mine, the Kearsarge, a supposed extension of his old mine, the Comanche above referred to, and after expending some \$15,000 in prospecting it, thinks he will soon abandon it as a failure.

Eight miles southerly from Benton is an immense ledge, cropping high above ground, of gold quartz, paying from \$12 to \$50 per ton. The leading location on this belongs to Messrs. McNeil, Sbaa & McBride. For some weeks past the two former have been running a horse arastra upon these ores in hopes to obtain a reliable working test of their general value. Their hopes, however, are likely to be disappointed measurably, inasmuch as the sulphurets make perfect amalgamation by this process impossible. At least such were their own anticipations, though they had as yet made no clean-up to fully determine results.

The general confidence in the permanence and undoubted value of the three leading mining properties, to wit, the Diana, Comanche and Yellow Jacket, each comprising two or more opened mines, was never better assured than at this moment; yet, owing to the partial suspension of operations, particularly in hauling ores, for the reasons above given, times in Benton are very much duller than at any time previously for the last two or three years. And it is not unlikely this state of affairs will continue for perhaps three or four months yet, after which we feel assured Benton will enter upon a livelier era than ever before witnessed in all her remarkably prosperous history.

The Mack & Fargo saw mill, a costly and very complete institution, was recently completed, and is now turning out lumber rapidly, as also is that of Hightower & Yaney; so the lumber market will be amply supplied and some to spare. These mills, both located on the Adobe meadow slope, some 18 miles westerly from Benton, supply the entire demand for lumber for the Belleville and Columbus region, embracing an area of say 100 miles to the eastward.

### Transportation of Sulphur.

In our last issue we gave an account of the mining and manufacture of sulphur on this coast. The following in relation to the shipment of this substance is given to the *Commercial News* by Mr. Davidson, agent here for Lloyd's Register of British and foreign shipping: In reference to the letter received from the secretary to Lloyd's, enclosing one dated the 11th of April, from the Australian and New Zealand Underwriters' Association, relating to the damage done by sulphur in the ship *Glen-gairn*, in which vessel sulphur escaped among the cargo, and there being water in the hold "a quantity of iron was mentioned as having been reduced to a heap of mud by the action of the water and sulphur combined," the following remarks are offered for the consideration of the committee:

Sulphur is known to have a very strong affinity for iron under certain favorable circumstances, and this is rapidly promoted by heat. It has been found in the case of piston rods working through vulcanized packing that, after being left in one position for some time, when heated by previous working, the free sulphur contained in the packing has produced a sensible depression in the surface of the piston rod; and in consequence of this, the proportion of sulphur used in the preparation of such packing has been reduced, when employed in the royal navy, to one-half the previous amount.

The actual effect of salt water in promoting the action of sulphur on iron does not, however, appear to have been so generally understood, and we have consequently delayed reporting on this case until some experiments could be made to indicate the nature of the chemical action that takes place under circumstances somewhat similar to those described in the *Glen-gairn*.

Some pure salt water and some sulphur were placed in connection with pieces of iron, and they have been allowed to stand nearly three weeks. On examination it is found there is present some red oxide of iron, or rust, such as would be formed by the salt water and iron alone in combination, and there is also a quantity of black deposit, which might well be likened to mud, as in the letter referred to.

Upon dissolving some of this deposit in hydrochloric acid, offensive fumes of sulphuretted hydrogen were emitted, showing that a chemical compound of sulphur and iron had been formed, or in other words, that the sulphur and salt water combined had produced a chemical effect on the iron and dissolved a portion of it. Other tests were applied showing clearly the presence of iron in chemical form in the deposit referred to.

The iron has not yet been cleaned to ascertain the extent to which it has been eaten away, as it is thought desirable to allow the ex-

periment to proceed for a longer period; but the evidence of the chemical action alone is sufficient to show the importance of guarding against the carriage of sulphur in bulk, especially in iron ships, and it appears to be fortunate that the *Glen-gairn*, in which the circumstances related occurred, was a wood vessel.

### Treating Nickel and Cobalt Ores.

For the treatment of nickel ores, consisting of silicates of nickel and magnesia, containing variable quantities of other substances, more especially the nickel ore of New Caledonia, an improved process has been presented by Mr. E. L. Montefiore, of Paris. The ore, after having been reduced to a fine powder, is attacked by strong sulphuric acid, preferably at 60 degrees Beaume. This can be effected either by solution in the ordinary manner, or by the mixture of the pulverized ore with the requisite quantity of sulphuric acid, according to the composition of the ore, the proportion of acid being such as is sufficient to transform all the nickel and magnesia to the state of sulphates. The mixture being put into heap gets spontaneously heated, or the sort of combustion which takes place can be provoked or hastened by the application of a burning substance; the mass becomes heated and hardened by the transformation of the mass into a mixture of soluble sulphates and anhydrous silica. The soluble sulphates are separated by treatment of the mass with hot water, which then contains the salts of nickel and magnesia and the iron partly in the state of protosulphate. The iron is peroxidized by one of the processes well known, and is then precipitated by carbonate of magnesia, or by one of the known agents, but he prefers the use of a milk of magnesia. The iron may also be peroxidized partially or totally by the calcination of the pulverized ore, either before or after sulphatization, and, if necessary, by the admixture of a proper quantity of nitrate of potash or nitrate of soda.

The solution being separated by decantation, washing and filtration, contains now only salts of nickel and cobalt with magnesia, this solution being heated by steam or otherwise. A sufficient quantity of milk of magnesia (an emulsion of caustic magnesia) is added to precipitate all the nickel, or an excess of magnesia may be used, and after separation of the excess of liquid the precipitate may be treated either with a solution of sulphuric acid, or an excess of a solution of sulphates of nickel and magnesia, which takes up all the excess of magnesia. The colorless liquid is a solution of sulphate of magnesia, which may be concentrated by evaporation, cooled and crystallized for sale. The remaining oxide of nickel is well washed, dried, calcined, and reduced by the ordinary methods used for obtaining metallic nickel from the oxides of that metal.

The solution of soluble sulphates obtained from the ore by the above-named process may be evaporated to dryness, and the residuum calcined, either alone or after mixture with the quantity of salt-peter necessary to convert all the iron to the state of insoluble peroxide, easily to be separated by washing. The solution containing nickel (and cobalt) with magnesia, may either be treated by the methods above described, or may be evaporated to dryness and calcined with mixture of salt-peter of magnesia or of carbonate of magnesia, in quantity sufficient to decompose the sulphate of nickel and reduce it to the state of oxide. The mixture being now washed, the nickel remains in the state of a gray oxide, which may be washed, dried and reduced to the state of metallic nickel by the methods generally employed.

A continuous reduction is preferred by Mr. Montefiore to any other for the reduction of the oxide of nickel to the metallic state. This consists principally of one or several pots or tubes placed vertically, and open at both ends; they are so placed in the furnace as to be easily exposed to the required heat; the upper end of each pot or tube, protruding higher than the top of the furnace, is covered by a movable cover; to the lower part of the earthen tube or pot is adapted an iron tube closed by a sliding door. The oxide to be reduced is introduced by the top into the pot or tube after being mixed with coarsely pulverized charcoal; the reduced metal is withdrawn at the bottom, mixed with the excess of charcoal, a new supply of mixed oxide and charcoal is introduced at the top, and so on continuously. It is evident that the time given for the reduction can be regulated at will by the regulation of the intervals for withdrawing the reduced metal and the quantity withdrawn each time. As the work is continuous, and the pot never allowed to cool, this mode of reduction is very economical.

The essential features of the invention are the treatment of the pulverized ore, calcined or not, by sulphuric acid, and especially the rapid combination, as described, without solution; the separation of iron from its sulphates by magnesia, the separation of nickel from the magnesia in their sulphated solutions by magnesia, thereby obtaining nickel without magnesia, or with but slight traces of this substance, and, on the other hand, sulphate of magnesia exempt from foreign matters; the evaporation to dryness of the solutions of the mixed sulphates, and the separation successively of the iron and nickel by calcination with the mixture of salt-peter for the first-named metal and magnesia for the second, and the use of pots, open at both ends, for the continuous reduction of the oxide of nickel.

### Park City Mines.

A correspondent of the *Salt Lake Tribune* says: A large vein of milling ore has been found near Swift's mill and the Pioneer and Flag-staff mines, which promises, when thoroughly opened, to rival the Ontario and take away the quasi reproach, "Oh, you have only one paying mine in your camp." Too much cannot be said for the Ontario mine and its management. From the beginning, it has had an experienced superintendent, and it is a singular fact that it has not failed to pay since breaking the ground. Most mines show poor and rich spots, but the poorest of this pays something and the richest is marvelous. But the Ontario is not the only mine of the camp by a good many. I am prepared to prove this fact to any one who wants a mine of milling ore.

I can show a ten-foot vein that assays from \$10 to \$110 per ton, nine-tenths silver and one-tenth gold. But little work has been done as yet, but the vein has been traced 4,000 feet. Two spurs have been discovered that make into this vein, 1,000 feet apart, which assay \$36 per ton in the croppings. One has been located by the Swift boys, and they are now opening it. The two others have been located and show good croppings. Several good prospects, with the usual "Fabian policy," are lying idle, waiting to wear out contending owners or hoping to sell without development.

That this camp will be one of the best in the Territory, both in the quality and number of its mines, is a belief shared in by several old miners who have been here a long time. Prospecting is more lively this summer than ever before, and the return of several parties who have been the rounds of the Black Hills, Arizona, Leeds, etc., satisfies our miners to stay at home. The verdict of returned prospectors is that there are more good mines and easier obtained in Utah than any other place they can find. We will give you a good report of the Park and its summer developments before the summer is over.

THE HINDAGO.—Everything is progressing finely at this mine. The miners have been hothered considerably lately by foul air, but having procured a No. 8 Sturtevant blower, and run tin pipes down the incline, now have in the drift a surplus of good air, which every miner knows is an indispensable article. The drift, at the 100-foot level, is now in 140 feet, the last 80 feet being in ore of an average grade. This drift was started with the intention of cutting a cross ledge supposed to be distant 100 feet from the bottom of the incline, but subsequent working proves that the ledge pitches at a sharper angle than was at first surmised, and the drift will probably have to be carried 80 or 100 feet farther before striking the ledge; however, the ore taken from the drift has more than paid expenses since it was started. The winze, sunk 70 feet from the incline, is now down 25 feet. At this point the ledge was only two and one-half feet wide, but has gradually widened, and at the present depth the ledge is seven feet between the walls, most of which is ore of a high grade. Taking everything into consideration, we do not know where a better looking prospect could be found than the Santa Rita company now have in this mine. We predict that, ere many months pass, they will be amply paid for what capital they have expended in Coso district.—*Coso Mining News*.

ANCIENT MINING IN IRELAND.—There is a very interesting article on ancient mining in Ireland in a late number of the *Kilkenny Archaeological Society's Journal*. After speaking of the workings in various parts of Ireland, the writer turns to West Cork. Ancient mine workings have also been discovered in the west of the county of Cork. In 1846, Capt. Thomas, an experienced Cornish miner, while searching for copper on the lands of Derrycarhoon, near Ballydehoh, came on some ancient workings; a neighboring gentleman communicated to the late Mr. John Windele an account of the discovery, in which he states that they were six in number, all parallel bodies; one was about 30 fms. in length, 10 fms. deep, and 10 feet in breadth. They were found filled at the bottom with rubbish, and the top was overgrown with peat, in some places to a depth of 14 feet. A number of stone hammers were found at the bottom of the mine weighing from three to seven pounds, similar to those already described as found in the bottom of the old workings at Killarney; also a curious sort of tub of oak, of a curved form, which was in the Dublin exhibition in 1853, and a ladder of black oak, 18 feet long, formed of a single solid piece, having 14 steps notched in the side. The lands of Derrycarhoon are stated upon competent authority to abound in mineral wealth—the green carbonate of copper occurring near the surface.

MOORE'S FLAT ITEMS.—A correspondent at Moore's Flat sends the *Nevada Transcript* the following interesting items: At the Watt shaft the pump and bolting works are running as smoothly as can be wished for. The cement or lava in the bottom of the shaft continues to be hard. The Blue Banks and Boston mines, on Woolsey's Flat, are running on bottom gravel. The above company expect to make good clean-ups in a short time. The Eagle, Illinois and China companies, on Moore's Flat, are also running on bottom gravel. These mines will pay dividends to stockholders this fall. Cowger, at Snow Point, is working seven men. It is said that he is doing well. The Moore's Flat Blue Gravel company's tunnel is advancing very favorably.



## MECHANICAL PROGRESS.

## How a Brooch is Made.

The jeweler's art is one into which workmen in other crafts get but little insight. We have been interested in reading an article written for the *Polytechnic Review* by Herman T. Wolf, on the practices of the manufacturing of jewelry, and we quote therefrom an account of the steps taken by the workmen to make a brooch, when two pearls and thirty-one diamonds, with necessary tools and materials, are furnished:

The main points to be kept in view are to show off the stones to the best advantage, and, if they are perfect, to have no more gold than is absolutely necessary, so that their effect may not be marred. It will first be necessary for him to make the "settings" for the stones. For this purpose, he works out a piece of gold about three-sixteenths inch high and at the bottom one-sixteenth inch thick. From this he hends the boxes for the pearl and five upper stones. Of these he makes the settings by scalloping them out, first from the top and then from the bottom, and then solders the small frame under them for a finish. (The solder consists of gold of a lower grade, which, melting at a less heat, firmly unites the parts between which it flows.) Having done this, he next makes the "cluster." Into a piece of gold about an inch in diameter, and three-eighths inch thick, he makes holes just so much smaller than the stones as to allow setting. Next the outer edge of the "cluster" is finished like a setting, and scalloped "bizzle" and frame soldered under. Now he makes the mounting for the other diamonds. A frame like the contour is made, which is scalloped, and upon which a thick plate is soldered and into which the diamonds are afterwards carefully mounted. The "knife edge wire" is made from gold bent into the shape of the design and filed sharp at the top. The gold band for the enamel is so arranged that it can be secured after all the rest is finished, in order that the entire work need not go through the enameling fire. The small shot are made by melting particles of gold, which thereby assume a globular form and retain it upon cooling.

And now all is ready for construction. This is done by placing the pieces upon a flat charcoal, applying borax and small pieces of finely cut solder to the places where the pieces are to be joined, and heating them by means of a gas jet and blow pipe till the solder "runs."

After all the soldering has been completed the work is boiled in dilute sulphuric acid, to clean it of oxide and borax, carefully trued with files, all the file-marks removed with a scraper and emery paper, and the task is ready for polishing.

This is done first by means of tripoli and oil, and afterward with rouge and alcohol. By means of gravers, rests for the stones are cut into the settings, and the gold securely pressed over their edges, and the brooch is completed.

In the manufacture of the so-called "Etruscan ware," the delicate wire ornamentations are all bent into shape first and then soldered on the jewelry according to the design. The neat fine-gold-like appearance is produced by immersing the jewelry for a few minutes in a boiling solution of muriatic acid three parts, saltpetre two parts, salt one part. This eats out the alloy and brings the fine gold to the surface. Since it attacks copper more readily than silver, a finer effect is produced by alloying the gold with an excess of copper.

A very praiseworthy attempt has of late been made to reproduce flowers in their natural colors and details; but, due to the amount of labor necessarily expended upon them, they command higher prices than is generally invested by the majority of purchasers. It is sincerely to be wished that they may gain the approval of the public.

By the combination of platinum with red gold for seals, rings, and chains, many novel and very effective designs have been produced. In making plain linked watch chains, the links are wrapped about a mandrel having the exact shape that they are expected to assume. They are then cut apart at one end, hung together, and the joints soldered.

Oxidized silver, so much in vogue a few years ago, is made by treating silver with ammoniac or potassic sulphide.

Enamel is a fusible glass which is melted into cavities in the gold, made by cutting to some little depth with a graver.

Niello, lately fallen almost entirely into disuse, is a black composition of gold, silver, copper and lead heated together, and melted into a design prepared in the same manner as for enamel. The metal is then scraped and burnished, and produces the effect of a drawing in black upon a gold or silver ground.

## Coupling Cars.

The danger and disaster which always attend coupling cars by the existing method has given inventors thought of ways by which the joint could be made without the insertion of the brakeman's body between the moving cars. We read in an English exchange of the following device to meet the need: The object which has been kept in view in this invention has been to save "life" and "time," with as little cost to the owners of trucks, etc., as possible, and the

principle which has been decided upon here is, that the couplings shall remain as they are with the ordinary link or chain, and the latter to be handled from the sides of the cars, so disposing with the necessity of a man passing between the trucks for coupling or uncoupling purposes. To effect this the end link or coupling link of each chain is gripped by a strong steel spring, whose other extremity is fixed to a horizontal bar, held loose by two eyes at each end of the truck. This bar has a curved handle at one of its ends, by means of which the fore-mentioned spring allows itself to be raised or lowered according to requirement; since the end or connecting link is also fastened to the spring, it follows that by turning the handle just named the coupling chain will also be raised or lowered according to the direction in which the handle is turned. Owing, however, to the horizontal bar being also able to move laterally, it follows that by pulling or drawing the bar handle either towards or from you, the end connecting link will be clear of the hook, or in a vertical line with it. Consequently, the left-hand car coupled to the right, supposing it were required to uncouple that car, all that is required would be for the shunter to seize the bar handle and turn it to the right until the end connecting link had been raised above the hook, when he would pull the handle and bar towards him, so as to get the link free of the hook in its downward fall. Having done this, he would let loose the handle, when the coupling chain of the left-hand car would assume a similar position to that of the right-hand car; naturally the converse of these operations would secure the re-coupling of the two cars.

## Rivets or Welds in Boilers.

We have formerly spoken of an investigation in progress as to the value of welded boiler shells. The verdict in the present case is in favor of riveted joints. In his last quarterly report, just issued, Mr. Lavington E. Fletcher, the chief engineer of the Manchester Steam Users' Association, makes the following remarks about welded boilers: One of the explosions referred to in the report sprung from a boiler welded at all the joints instead of being riveted. The association has always regarded welded boilers with suspicion, and, as such boilers are being increasingly introduced for crane and portable purposes, it appeared desirable to call attention to the untrustworthiness of such a mode of construction.

When a boiler is riveted, the strength of the seams can be known with considerable accuracy. The amount of metal lost by the rivet holes can be calculated and allowed for, and what remains, provided that the work be put together with ordinary care, can be trusted. Such, however, is not the case with a welded joint. It is impossible to see into the heart of the weld and to know whether it is sound or not. The parts may be united simply at the surface, skin deep, and no further, and though such joints may withstand the quiet strain of a hydraulic test they may yet fail in actual work. As soon as steam is got up in a boiler, it expands and contracts from alternate heating and cooling, and the flat surfaces breathe in and out according as the pressure falls or rises. This working of the parts soon finds out the weak places, and though a small crack may be all that is started at a weld in the first instance, as the working goes on the crack extends and grows from a small one to a large one till a serious rent results. Welds are, therefore, untrustworthy for those parts of a boiler in which the pressure of the steam acts internally and tends to tear the welds asunder, but welding may be safely adopted for the internal flues on which the pressure of the steam acts externally and tends to keep the parts together. Boilers welded throughout, therefore, are not to be trusted, and the members are recommended to adopt those made with riveted joints instead.

**IRON PAVING.**—By permission of the Commissioners of Sewers of the city of London, a portion of the new wood paving in Beech street has been charged with iron (three cwt. to the square yard) by way of experiment. The object is to increase the durability of wood and preserve and protect it from heavy racking traffic, and to test the practicability of securing small blocks of iron without framework, and so as to deaden the noise and counteract the other disadvantages of metal, as hitherto applied. The ordinary wood paving blocks are beveled by machinery on the upper and lower edges, and between each row is laid a row of cast-iron blocks of double-wedged section thicker at the upper and lower surfaces than in the center, so as to fit mechanically between the beveled wood blocks, which on section are thicker in the center than at the upper and lower surfaces. The iron blocks weigh 16 pounds each, are rounded and serrated on surface for foothold, and perforated for grouting material, and are imbedded in sand on the ordinary concrete bed. The designer and patentee, Mr. Dennison (a London architect), states that the cost, though heavy at first, will not in the long run exceed either granite, wood or asphalt.

**HOOP IRON FOR CEILINGS.**—Mr. R. Leigh, England, has taken out a patent for applying hoops to ceilings. The hoops are used in single lengths reaching between the joists like wooden laths, or they are first formed into squares or sheets, interlocked like wicker-work, or interlaced with wire or other material, and then nailed to the joists. The hoop iron is made of curved sections to increase its strength.

## SCIENTIFIC PROGRESS.

## Electric Sparks as Bedfellows.

**EDITORS PRESS:**—I have several times this summer noticed a phenomenon, new in my experience, no account of which have I ever seen in print. It is the electric spark and light from the cotton sheet and bedspread. When I called attention to it and showed the light to some friends in the evening, my landlady remarked that she had several times been startled by the crackling sounds as the beds were stripped in the "morning making up." She did not know how to account for it. She compared the sound to the hitting together of buttons on a string. But my practiced ear at once detected the electric spark. I first saw the light as I was gathering the sheet about my arms. Shaking and rubbing were tried frequently, but not always producing light. One good experiment is to draw the back of the finger nails quickly along the sheet or spread. Streaks of phosphorescent light follow each finger. The sparkle and light are frequently shown on stripping the spread from the blanket or comfort. It is a well-known fact that dry silks or woollens will sparkle on a dry, frosty night, but it was a new source of amusement to me to see a cotton sheet or spread sparkle like a cat's back. I presume that this effect can be noticed anywhere, away from the coast fogs, whenever the thermometer rises above 90° during the day.—**JEIGH ARRH, Auhurn, Cal.**

## Prize for a New Sugar Extraction Process.

The General Council of Guadeloupe offers a prize of \$20,000 to the inventor of a new process of extraction of juice of sugar cane or of sugar fabrication. This prize will be given to whoever obtains from the cane a yield of 14 per cent. sugar. The cost of application of the new process should not exceed 40 per cent. of the value realized. Experiments will continue four years, terminating June 30th, 1880, and will take place at Guadeloupe under the auspices of a government commission. All cost of transport, etc., must be defrayed by competitors, and applications, etc., must be addressed to the Director of the Interior, Bassé Terre, Guadeloupe. *The Scientific American* says:

"The case filed at Guadeloupe contains 18 per cent. sugar. Hitherto a percentage of 9.4 on an average has been obtained by the ordinary factory machinery. Recently M. Ducharsaing has invented an imbibition process, the details of which are not given in the legislative document before us, but which, it appears, increased the yield from 9.4 to 11.64 per cent. The inventor himself claims a greater advantage, and insists that the additional percentage of gain by his process is 2.33 instead of 1.64. Even on the lower estimate, M. Ducharsaing's invention was deemed sufficiently important to warrant the awarding to him of a \$20,000 prize. The present premium is therefore a second one, and the winner is called upon to make a still further improvement. The experiments must be conducted on at least 660,000 lbs. of cane."

## Something New about Oxygen.

Recent investigations, says the *Journal of Chemistry*, have disclosed the singular fact that oxygen under high pressure rapidly destroys all living beings and organic compounds. All varied phenomena of fermentation, in which the chemical action depends upon the presence of living organisms, are completely arrested by the action of compressed oxygen, even if exerted for only a brief time; while fermentations due to dissolved matter, like diastase, perfectly resist the influence. M. Bert, to whom this curious discovery is due, has found a practical application of it in the field of physiological research. The ripening of fruits is arrested by exposure to compressed oxygen, and hence it must arise from cellular evolution. The poison of the scorpion, on the other hand, whether liquid, or dried and redissolved in water, entirely resists the action of the compressed gas. Such poisons evidently owe their power to chemical compounds akin to the vegetable alkaloids. Fresh vaccine matter, subjected for more than a week to oxygen under a pressure equal to fifty atmospheres, retained its virtue; from which it would appear that the active principle in vaccine matter is not certain living organisms or cells, as some have supposed. The virus of glanders, after similar treatment, quickly infected horses inoculated with it; and carbuncular blood, though freed from bacteria, was found to retain its dangerous properties after the same test. These must, therefore, be put in the same class with vaccine matter. If these results are confirmed by further investigations, the discovery is certainly a most important one, and will lead to the settlement of many disputed questions in physiological chemistry.

**A NEW BAROMETER.**—A sensitive new barometer has been brought before the Physical Society of St. Petersburg by M. Gontkowski. *The English Mechanic* says: In this apparatus a mercury column of invariable height equilibrates almost the whole of the atmospheric pressure, and a column of petroleum oil completes the barometric column. The barometer has at its

upper end an enlargement, in which is fixed, with a plug, another tube 1.40m. in length. The two ends of this latter tube have been closed at the lamp, but a lateral slit is made in the part introduced into the enlargement of the first tube. This slit is covered with bladder skin, previously treated with benzine, and coated with a solution of gelatine in glycerine; it is firmly attached about the tube by its two edges. Thus the ladder forms a partition, at once flexible and impermeable, between the mercury filling the first tube and its enlargement as far as the plug and the petroleum of the second. Experiments have shown that the resistance of this partition to flexure produces a loss of pressure less than 1.60thm. of mercury. The petroleum is 15 times lighter than mercury, and does not emit of vapor of appreciable tension at the ordinary temperature.

## Testing Thermometers.

Those who are familiar with English thermometers know that manufacturers offer for a small advance to furnish an instrument the accuracy of which is verified by the government officer at Kew observatory. At the late meeting of the Royal Society, this officer gave some account of his work. The number of thermometers sent to be tested is increasing, there being now some 3,000 annually. For greater accuracy and for saving time, Mr. Galton devised the present apparatus. The thermometer frame is circular and will hold 40 at a time; the water into which they are placed is in a cylinder of stout copper, two feet two inches high and four feet in diameter, and in the side is a slit one foot ten inches long and four and three-fourths inches wide, which is glazed, and through which the thermometers are read as they are passed round. The cylinder is an outer wooden case, and between the two is a packing of sawdust. The outer case is also provided with a glazed slit to read through. The lid of the case has also a covering of sawdust in kamptulicon. The object of these precautions is to prevent the escape of heat and maintain a fixed temperature during the testing. The regulation of the heating of the water before testing is effected by a connected coil of tubing at the side and a cluster of Bunsen burners. So well does this apparatus act that a long series of experiments made at different temperatures shows a variation of but a part of a degree, which is represented by a figure in the second decimal place. It is still found to be impossible to obviate differences of temperatures at different levels. This, however, is a great improvement on the old method. It takes only about four minutes to read a set.

## Telephonic Improvements.

Prof. Bell, the inventor of the telephone, lately married, and at the wedding reception there was an exhibition of the new invention. He has gone to Europe to experiment with the cables between England, France and Germany, prior to attacking the Atlantic lines.

The latest form of Prof. Bell's telephone, says the *Boston Transcript*, has the whole machine, both for speaking into and hearing out of, reduced to the size and shape of an ordinary door knob. A shiny black piece of thin iron, the size of a three-cent piece, let into the surface of the mahogany knob, is what does the talking. Concealed in the wooden stem of the knob is the magnet, from which proceed the silk-covered wires which carry the *viva voce* message. There are two knobs, so that two may listen to a reply, or a single listener increase the amount of voice heard by holding one of the knobs to each ear. A common electric bell, operated by the same wire, to call, completes the equipment. It is still wonderful, notwithstanding the increasing commonness of the telephone, to hear a superintendent or head of a house in the city making inquiries and giving orders to his foreman out at the mill or factory, 20 miles away, and receiving equally detailed answers and inquiries for instruction in returns, such as could hardly have been transmitted by the "piano-playing" telegraph, so costly in time would conferences of that length have been.

So large has the demand become, that the price for the use of the telephone, which the patentee does not sell, has just gone up from \$10 to \$30 a year. It seems to us, however, that the perfection of this most beautiful and important invention has yet further to go.

**ELECTRIC ILLUMINATION AT SEA.**—The English iron-clad *Alexandra*, supposed to be the finest afloat, has an electric lamp attached to its foremast. The *Polytechnic* says the cost of the lamp and the necessary electric apparatus was £1,000, a sum which seems enormous at first, but does not appear so very extravagant when we reflect that it is supposed to protect a ship the insurance of which amounts to £600,000. The electric light serves two purposes; first, as a beacon light to point out dangerous reefs of rock or sand; and second, as a protection against torpedo boats. The light is thrown out from all sides of the lamp, and illuminates such a large surface of the water that it would be almost impossible for a torpedo boat to approach without detection; especially as the light falling upon the smoke would suffer such refraction as to make the boat's existence even more apparent than if the light had but fallen on its surface. This latter function of the electric light is very important, since ships have heretofore found no protection against the attacks of the torpedo boat.







# MINING SUMMARY.

The following is mostly condensed from journals published in the interior, in proximity to the mines mentioned.

## California.

### AMADOR.

**ST. LOUIS.**—Amador Ledger, Aug. 11: This quartz ledge is situated at Irish Town, a few miles from Pine Grove, and is owned by A. Vandament and four others. The shaft is 20 feet deep, the ledge showing about 18 inches wide. The last crushing, made in an arrastra some time in the spring, consisted of 20 tons of rock, which yielded \$445, an average of \$22.25 to the ton. There is no water at present, but the claim is being put in order for the resumption of mining operations as soon as water will permit.

**MAHONEY.**—On Tuesday of last week rich rock was struck in the 800-ft level. The specimens are handsomely ornamented with free gold and sulphurets. It appears that pending the decision of the courts as to the future control of the mine, the faction in possession are doing a little in the prospecting line, with encouraging results.

The Amador Con. cleaned up last week, realizing somewhere near \$16,000, rather a small pan-out for the leading mine of Sutter Creek, but still a sum sufficient to leave a considerable margin for a dividend.

This Volcano tunnel undertaking is now in 640 feet. The drilling machinery lately put up is an improvement. It is being compressed air, the motive power being water. It is not yet in position, and it is very doubtful whether there will be sufficient water to enable much to be done before the rainy season.

**TALISMAN.**—Good reports continue to reach us from this mine. A four-foot vein of excellent rock appears in the stopes above the 600-ft level. Workmen are engaged in sinking through new ground, for the purpose of opening up a new level south for air. They are down 70 feet, and the indications are good.

**POTOSI.**—The steam hoisting works are nearly completed. A tunnel has been started from the south side of the hill to intercept a vein lying near the surface. The Potosi is thought by all experienced miners to be a No. 1 mining property, and under the energetic management of John Tregloan it will be worked for all it is worth.

**VOLCANO.**—Beside the Volcano tunnel, the same company are driving another tunnel about one mile below town to prospect a large quartz vein, and are confident that they will strike it rich. Stewart & Co. have struck rich ore in the Confidence mine. Down, of Sutter Creek, is looking after the old Pioneer mine, repairing the shaft preparatory to more extensive operations. Other mines in the vicinity are looking well.

### CALAVERAS.

**UPPER COUNTRY ITEMS.**—Calaveras Chronicle, Aug. 11: Hall's mill is running on Carey rock. The mill—which is a new one lately put up—works splendidly. The Austrian mine, near West Point, has lately been supplied with new hoisting works. The mine looks well. Messrs. Carlton & Ochoa have opened out an old mine near West Point. The mine had been worked in former years, but was abandoned on account of water. The present owners intend putting up new and powerful machinery. Vein, 12 feet wide; rock averages \$100 per ton. Champion sinking and stoping out rock. Golden & Smith have recently struck rich rock in their mine at Summitville. The company own the Good Hope, San Bruno and Vance mines are pushing things ahead vigorously. A tunnel is now being run to intercept a vein lying near the surface. The tunnel, when completed, will tap the latter at a depth of about 500 feet. Potter & Rogers still continue to take out good rock.

### INYO.

**RICH STRIKE.**—Coso Mining News, Aug. 11: Mr. Taylor, Superintendent of the Emigrant mines, Lee district, came recently to this mining. He reports a rich strike in one of their mines. We saw some of the rock, and it is the richest we have seen for many a day—showing gold, sulphurets, native, horn and ruby silver, discernible with the naked eye. As we have to catch the mail to-day we have not the space to say any more than we have, but the specimens can be seen at Dr. Howard's drug store. We are sure all this country will show up well when the mail comes. Taylor also brought in another bar of bullion, of 80 pounds, which is fine indeed. Good.

**COSO CON.**—This mine is looming up. The company have engaged Abe Lida to haul the ore to the Defiance furnaces. He commenced transporting same on last Monday, averaging 25 tons per day. There are yet lots of ore on the dumps at the mine, which will be hauled as fast as possible.

**NEW MINING MANAGER.**—Inyo Independent, Aug. 11: The Rex Montis company have a new Superintendent in charge—Mr. W. J. Spaulding, vice J. H. Holt, Esq. The company propose continuing for the right to retain possession of and work the old Silver Sprout mill, under lease, and propose to put a heavy force on the mine. The Edipse has been bought by the arrival of Prof. W. T. Rickards, Fellow Geological Society of London. He is a man of wide mining experience on this coast, and in fact nearly all over the world. Having thoroughly investigated Ellipse affairs, he has appointed Mr. Nelson as assistant superintendent, and is rapidly putting things in a proper shape for successful work.

### KERN.

**MARBLE.**—Coso Mining News, Aug. 11: There is scarcely a day that passes without the hearing of some excellent new find in this vicinity. Some three months ago it was reported that a discovery of good quality marble had been found in Kern county, and Leland Luce, of the firm of Aitkin & Luce, workers in marble at Sacramento, went to Tehachapi pass, on the Southern Pacific railroad, and in prospecting for marble, accidentally made the find of a ledge of Giallo Antico marble. The above-named marble was wrought, but the quarry lost some five or six hundred years ago, so that now even the location of the quarry is unknown. The marble found by Mr. Luce is identical with that of the Giallo Antico, or so pronounced by an old Italian marble artist of San Francisco, who says he has seen the original worked up into all kinds of designs, but mostly in the manufacture of jewelry; and so valuable had it become because of its rarity that it was worth its weight in gold. The ledge discovered by Mr. Luce is the only one of the kind now in the world. The base of the marble is white, with veins running through it in all directions and shapes free from flint and can be given a perfect surface and polish. By those who have seen it, it is considered the most beautiful marble now worked. The ledge is located in Kern county, California, at a place known as Tehachapi summit, or pass, three miles westerly from the railroad station and one mile from Tehachapi, and is owned by Aitkin & Luce, of Sacramento, who propose to incorporate and supply the world with it. Wherever it is seen it cannot fail to be appreciated.

**NEW ENTERPRISE.**—Nevada Gazette, Aug. 11: A company was incorporated some time since for the purpose of working a body of ground above the claims of the North Bloomfield gravel mining company's grounds, and we learn that operations will be commenced soon. Mr. Derbae is the manager. It is their purpose to consolidate the claims owned by Dick Skidmore, Souchet and others with that owned by the company. There is ground as rich there as that owned by the North Bloomfield company, and as this company have abundant claims, it is no doubt but another extensive mine will be opened, which will help to swell the gold yield of the county. That section of our county is attracting the attention of capitalists at the present time, and all who visit it come away with the conviction that no better field for mining enterprise could be found on the coast.

The South Yuba canal company continues to furnish

water to miners, but it is expected the supply will be cut off soon.

This incline of the Providence is now down 845 feet, and the ledge at the bottom is large and the rock is looking better than ever.

This rock in the bottom of the incline of the New England is looking better than any yet taken out of the mine. The new machinery is all in place now and ready for work.

The new steam hoisting works at the Soggy mine is about completed, and one of the engines was started up and pumping commenced this week.

The Centennial mining company, still running ahead with their tunnel and expect to strike the channel every day. BRADLEY & Co. have commenced work on the old Montana mine, above the Magnolia. As soon as it is pumped dry they will go to sinking and taking out rock.

Smith's mine, at the Half-Mile house, is looming up in the market, and is being taken out that good judges think will yield \$400 a ton.

Forty-eight tons of rock from Johnny Schmidt's ledge, at Wood's ravine, yielded \$2,400. Twenty tons more is being crushed from the same mine and promises even better returns.

SEVEN HUNDRED tons of quartz from the New England has averaged \$30 per ton. A portion of it came from near the top of the ledge, and nearly all from a depth not to exceed 100 feet.

J. F. CARR has commenced work again at the Magnolia mine, at Willow valley. In early times, when worked on the surface, the rock was very rich down to the water level. For want of funds the owners have never gone below that, but on account of low water this year, they hope to get deeper than ever before.

PRINCE is going on at the Georgia gravel mine, near the Sugar Loaf. It is expected to have the shaft clear in a few days, when developments will commence to be made. If success attends this company, there is no doubt about other companies soon starting to work on their claims located on the same channel.

The Deadwood company have let a contract to run their tunnel into the ledge at \$20 a foot.

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NEVADA. A Good Ledge.—Nevada Transcript, Aug. 11: Johnny Schmidt's ledge at Wood's ravine, is panning out well. About five weeks ago he had 48 tons crushed, which yielded \$2,400. He has now out on the dump about 20 tons, which will be crushed at Church's quartz mill on Gold Flat. It looks better than the first lot that was taken out. Two men are taking out about four tons of rock per day, the ledge being about four feet thick. It is the cheapest working mine on the coast. The tunnel is run into the hill about 40 feet, and the rock is brought out in cars.

BAN OF GOLD.—We saw at the Citizens' bank, yesterday afternoon, a beautiful bar of gold worth \$2,500. It was the result of 100 tons of quartz taken out of the New England mine. Some of the rock was very poor, and it was crushed with the good, as it came from the mine. This company has taken out about 700 tons of quartz, and it has averaged \$30 per ton. That is what we call pretty good for a mine that has not been worked much for many years, until the New England company got the hold of it. The Idaho mine had declared its 50th dividend of \$5 per share. That mine is a good one, and the most economically, honestly and best managed mine in the State, else it never could have paid so well to the stockholders. There are many mines on this coast that pay better than the Idaho and the expenses ought to be less, and yet they are always assessing them. It makes a big difference when a mine is honest and honest men or rogues.

ALASKA MINES.—Grass Valley Union, Aug. 14: This mine is doing well and has number one prospects of continuing to pay. The underground appearances are good, and the work being done is systematic and after the most approved style of mining. The management, under the superintendence of Mr. M. Dodsworth, is economical and energetic. On the 20th of last month the Alaska paid the dividend of ten cents to a share of the capital stock, and the second dividend of the same amount will be paid on and after the 20th of this month. The Alaska is a new mine and is doing well.

### PLACER.

GOOD YIELD.—Placer Herald, Aug. 11: Some time ago we had brief mention of a new mine being opened near the old Calf Pasture mine, on Rock creek, by Heenan & Mollis. Since then developments have proved it to be a good mine. Last week they had 15 tons crushed at the Evening Star mill, which cleaned up \$49.50, an average of \$33.35 per ton, which is very good. The rock was not selected, but taken as it came out of the mine.

ST. LAWRENCE.—Placer Argus, Aug. 11: Osborne & Pearson have leased the St. Lawrence ledge from F. B. Thomas. It has been closed since the suspension of the Bank of California, W. C. Talston having been the principal owner. The lessees are opening up the shaft with unusually good prospects. It has a 15-stamp mill. The ledge is two feet half, and three feet thick. The rock assays \$10, \$12 and \$16 the ton.

The shutting down of the St. Patrick mine has caused idle miners to go out prospecting, with a strong probability that out of this present evil will come much future good.

## Nevada.

### WASHOE DISTRICT.

CALIFORNIA.—Gold Hill News, Aug. 15: Daily yield, 550 tons of ore, keeping the mills crushing to their full capacities and turning out the usual quantities of bullion for shipment. The ore stopes are looking well and yielding good ore at every point which is being worked from the 1400 down to the 1850-ft levels. Owing to the repairs now going on at the Consolidated shaft, no ore is being hoisted from the 1500-ft level. These repairs will, however, be completed in a day or two more, when the extraction of ore from that portion of the mine will be resumed. The ore stopes on the 1000-ft level, extending south from cross-cut No. 5, are widening out and the ore is of a very rich character. The 1350-ft station, in the C. & C. shaft, is now being cut out and the station timbers put in. The flow of water at the bottom of the shaft is still strong.

MOLAR PANS.—Daily yield, 90 tons of ore, the assay value of which is \$22 per ton. Sinking the combination shaft is going steadily ahead. On Saturday last, this shaft wanted but 40 feet more in depth to carry it, by actual survey, to the level of the Sutro tunnel; by or before the 1st of September it will have passed the point at which the tunnel will strike the shaft. The shaft has been sunk to this depth without the use of a pump, nothing having still in good use. The flow of water at the large iron skeds used for hoisting rock. The flow of water at times has been quite strong, and heavy streaks of clay and soft ground have given much trouble in sinking, but so far all the troubles have been overcome and the work pushed vigorously forward in the most successful manner possible.

CROSS CUT.—Daily yield, 500 tons of ore. The ore stopes on both the 1400 and 1550-ft levels are yielding rich ore and looking finely. The ore stopes going southward on the 1550-ft level are especially fine. The upraise from the 1550-ft level to connect with the winze from the level above is making good progress and is still in rich ore. The double winze on the north line is now 105 feet, the bottom level is good ore. The flow of water at the bottom of the winze is steadily on the increase as the winze approaches the level of the north drift on the 1700-ft level of the Gould & Curry.

BELCHER.—Daily yield, 50 tons of ore, 48 of which is being crushed daily by the mills, and yields an average of \$23 per ton. Repairing the timbers in the perpendicular portions of both the old and drain shaft is being pushed ahead at a rapid rate. At the same time the sinking of

both shafts is being prosecuted with all possible energy. The air and drain shaft is now almost down to the depth of 2,000 feet, which corresponds with the 2000-ft level of the Crown Point. When the old shaft reaches the depth of 2,000 feet, it is the intention to stop its sinking, as the flow of water is strong and the cost of running the two shafts very great. The drain shaft will then become the main prospecting shaft, and the ventilation of the lower levels will be secured by winzes sunk at appropriate intervals below the 1900-ft level. The old incline will reach the 2000-ft level in about four weeks' time. A number of prospecting drifts and cross-cuts are being run on the upper levels, none of which so far show any very encouraging prospects.

JULIA.—The east drift on the 1800-ft level is being pushed vigorously forward, the face in more favorable ground than it has encountered for some time past. Diamond drills are being fitted up for use on the lower levels, as that is deemed a much cheaper method of cross-cutting than the running of long drifts, which require a large supply of fresh air.

JACKSON.—Daily yield, 850 tons of ore. The ore stopes are all looking well, and the yield of ore could be considerably increased were it desirable or necessary to do it. The upraise from the 1,000-ft level still continues in the finest character of ore. As soon as the Silver fill pump is started up, the flow of water will be reduced to the old standard.

ORFAN.—The main south drift on the 1300-ft level is showing some very favorable quartz in the face. Cross-cut No. 2 east, on the 1300-ft level, is being pushed vigorously forward, the face in very lively porphyry, carrying streaks of good looking quartz.

IMPERIAL CON.—The bottom of the winze below the 2200-ft level is still in a fine character of vein matter, carrying live streaks of the Savage, and an able and experienced miner, took charge of the mine as Superintendent, in place of Win. Hardy, who resigned in order to accept the superintendence of the Ophir and Mexican.

GRUB.—The north drift on the 900-ft level is being rapidly advanced, the face in very favorable ground. The south drift on the same level is also being energetically driven forward to connect with the south winze below the 1700-ft level. The east cross-cut from the bottom of the south winze on the 1800-ft level is steadily advancing, the face in favorable ground and showing evident signs of water ahead. This is the point at which an ore strike was recently reported, but had no foundation whatever.

BULLION.—Repairing the main shaft is going rapidly ahead. Since commencing the repairs it has been found that a greater portion of the shaft will need retreating than was supposed when the work was commenced. It is the intention, however, to make a thorough job of it.

SIERRA NEVADA.—The south drift, on the 1700-ft level, is making steady progress without change of value to report. Sinking the winze below the 1450-ft level to connect with south drift, on the 1700-ft level, is going steadily ahead.

ALFA.—The face of the west drift, on the 1050-ft level is showing a mixture of soft porphyry and clay, carrying occasional bunches and streaks of quartz of the most favorable character. The drift is evidently nearing the main vein.

SUCOA.—Sinking the shaft is making favorable progress. The rock in the bottom is quite hard, but blasts out well. The flow of water is much stronger since the stoppage of the Silver Hill pumps.

LADY BRYAN.—Work was resumed in full force and activity at the hoisting works of this mine yesterday morning, the new hoisting engine and other machinery having arrived. This will be placed in working position as fast as possible, the masonry foundations being completed some time since.

YELLOW JACK.—At the 2200-ft level, drifting north, south and east from the winze, is resumed. The main east drift is in 212 feet, and the face is now in a formation of clay seams and quartz. The north and south drifts are in porphyry, with good looking quartz seams. At the new working shaft to the eastward the rock met with is very hard, rendering the progress of sinking slow.

SILVER HILL.—The foundations are being prepared for the reconstruction of the new pump house, and machinery necessary to put the mine in good working order again.

UTAH.—The south drift on the 1150-ft level, running to connect with the north drift from the Sierra Nevada, is making the best of progress, the face in good blasting ground.

CALEDONIA.—The northwest drift on the 1000-ft level is steadily advancing, the face in quartz and ledge matter of a very favorable appearance, showing a lively improvement as the drift advances.

MEXICAN.—The north drift on the 1465-ft level, running to connect with the Sierra Nevada, is being pushed vigorously forward, the face in good blasting ground.

LEVATHAN.—The whole face of the main south drift at the 900-ft level is in good looking quartz, streaks of which show rich ore. The cross-cut below the main north drift at the same level is discontinued and drifting northward in the face of the main drift will be resumed forthwith.

SUTRO TUNNEL.—Face of header in hard andesite, but showing indications of becoming softer. The general formation being passed through at present is of the Comstock character, and it shows more and more so as the great mine workings of the main level are approached.

GOULD & CURRY.—Sinking the main incline is going steadily forward.

SAVAGE.—Last evening the water had been lowered to a point 20 feet below the 1000-ft level. The small pumps are kept lowered to the water level so that, working in conjunction with the Hale & Norcross pump, the body of water is being rapidly reduced.

UNION CON.—The east cross-cut from the bottom of the winze, on the 1400-ft level, is steadily advancing.

SOLD SILVER.—Sinking the winze below the main tunnel or adit is progressing somewhat slowly, owing to the large amount of water coming in.

BEST & BELCHER.—The east cross-cut No. 3, on the 1700-ft level, is being pressed steadily ahead, the face in a very favorable ground, with a strong flow of water coming in.

CROWN POINT.—The drift south from the main east drift, on the 2000-ft level, is steadily advancing, the face in good blasting ground.

HOMESTEAD.—During the first part of the week a strong flow of water was struck in the bottom of the shaft, which has been a temporary suspension of work.

HALE & NORCROSS.—The pumps are steadily gaining on the flow of water.

### BELMONT DISTRICT.

STRICK.—Belmont Courier, Aug. 11: A rich strike has been made in the El Dorado South mine, this week, which will make things lively here for some time before the many months have passed. We were shown some of the rock taken from this strike, which is rich in antimonial silver. While running an upraise from the lower level in the new ground, a clay wall was encountered, and, upon getting through this, a well-defined ledge was struck, which has been stripped for a considerable length and bored into a distance of five feet, all the way in rich rock that will assay from \$300 to \$350 per ton.

### BRISTOL DISTRICT.

WHEELER.—Pioche Record, Aug. 11: From Frank Wheeler, who returned from Bristol on Wednesday, we learn that the winze hoisting works of the Mayflower mine are up and have commenced running, works well and boisterously. The shaft is now down 135 feet; have broken through a boulder at the bottom of the shaft, and have struck ore which assays from \$40 to \$200 per ton. The ore body is increasing in width as depth is obtained; the prospects look better as work progresses. Steady work is kept up on the mine, day and night shifts being run.

### ELY DISTRICT.

RAYMOND & ELY.—Pioche Record, Aug. 11: There are still further improvements in the quantity and quality of the ore on the 1200-ft level as work progresses. The ore stopes on the 1000-ft level are looking very well and turning out well. In the other portions of the mine there is no change to report from our last; they are looking as well as they have previously. The Nevada Central is in good order, making regular trips. The mill continues to run on tallies.

BULLIONVILLE.—The business portion of Bullionville has been looking up considerably of late, owing to the fact of the large number of men employed at the two mills, the furnace and the concentration works. Boarding-houses, restaurants, bar-rooms and other branches of business have been started, all doing a thriving business. The furnace is not yet running; it is being repaired and otherwise repaired while awaiting a supply of coal with which to start. As soon as the coal is on hand it will commence work again, and there will be no more occasion to shut down on that score, as the supply will be kept up constantly.

ELY.—Monday last was pay-day of the Raymond & Ely mine, and, yesterday was the pay-day of the mine of the Alps company, and also the merchandise account of the Raymond & Ely. Over \$40,000 were disbursed. These pay-days have contributed not a little toward infusing new life into the veins and arteries of the town and trade.

### REESE RIVER DISTRICT.

CRESHINN.—Reese River Reville, Aug. 10: The Manhattan mill, after an idleness of 70 days' duration, started up again last evening. The Stedfeldt furnace was fired up this morning. The repairs and alterations which these reduction works have undergone render it one of the finest crushing mills on the Pacific coast. Every important improvement in quartz-milling machinery which could be made available, has been introduced, not the slightest detail being neglected, and no expense has been spared in the endeavor to make the mill as perfect as such an establishment can be made. Barring unforeseen accidents, the mill will now have a long and successful run and do better work than ever; and, even before the start, improvements, it was one of the most efficient mills in the State. It starts up on custom ores, of which there is a large amount on hand, belonging to chlorides and tributaries. We doubt if there is another Co. in the State that could, proportionately, have expended the same amount of money in improvements in mines and mills, as has been laid out for these purposes by the Manhattan Co., without resorting to an assessment on the stockholders, which, as yet, the Manhattan has never levied; and it speaks volumes in praise of the management that all this immense outlay has been made without calling on the stockholders for a dollar. It will be an unprecedented instance of careful and economical mine management, if, after all this great expense, the mines and works are carried on without an assessment being found necessary.

### STAR DISTRICT.

GRIZZLY.—Silver State, Aug. 14: From Peter Organ, who arrived here yesterday from Star, we learn that the Grizzly ledge, recently discovered by the Woolcock boys, is proving to be a valuable mine. At a depth of 20 feet from the surface, they have a well-defined vein, carrying three feet of solid ore, the greater part of which is selected for shipment to San Francisco, where it works from \$400 to \$600 per ton. Wm. Woolcock, one of the owners of this mine, has spent the greater part of his earnings for years, as foreman of the Arizona and other mines, in prospecting, and it affords us pleasure to state that he has at last what he has longed for, and his perseverance entitles him to a good mine.

### TUSCARORA DISTRICT.

DE FREES.—Silver State, Aug. 14: A change has been effected in the management of the De Frees mine at Tuscarora. T. E. Atkinson has been elected Secretary, and G. W. Grayson, of the Grand Prize, takes the place of C. E. Convis on the Board of Directors. The conflict of title between the De Frees and Young America North and Grand Prize has been amicably adjusted, leaving the De Frees title perfect. The changes in the management and the quieting of the title is mainly due to the persistent efforts of M. F. Freeman and Judge Keene, of Elko, two of the principal stockholders.

### WARD DISTRICT.

LOOKING UP.—White Pine News, Aug. 11: From Deputy Assessor George Comins, we learn that the body that assays from \$700 to \$1,000 per ton. This company have for some time been hauling ore to the Eberhardt mill, which it is expected will start up in September and make a run of three months.

### WHITE PINE DISTRICT.

THE TUNNEL.—White Pine News, Aug. 11: The Eberhardt & Aurora tunnel is now in something over 1,500 feet. The formation is still solid limestone, with no change in the last 800 feet. Since the new air-compressor has been put in operation, no more trouble has been experienced on account of ventilation.

RICH ORE.—The Stafford company, on Treasure Hill, has recently come upon an ore body that assays from \$700 to \$1,000 per ton. This company have for some time been hauling ore to the Eberhardt mill, which it is expected will start up in September and make a run of three months.

## Arizona.

PECK DISTRICT.—Cor. Arizona Miner, Aug. 8: There has been no rain in the district yet. The Luke mill in Bradshaw basin has hung up its stamps on account of the dry weather, and the mill has been attached. They have struck a bad strack in the north tunnel of the Peck mine, and a strong flow of water, too.

HUMBURG.—Humburg district lies east of Silver mountain and Castle creek, between Humburg creek, which heads in Bradshaw and the Agua Fria, the source of which is Lynx creek, near Prescott, and it is very undulating in its surface. The Tip Top company has made the most development, having several shafts, 90, 00 and 20 feet or so in depth, and showing plenty of high-grade ore, and were recently offered \$40,000 for the mine. The Cross Cut, near by, has a 45-ft shaft, and looks splendidly. Foy's mine has a 40-ft shaft, with two feet of high-grade ore in the bottom. The Tex, on which Cassy Thompson and others have a lease, has a shaft 20 feet deep, and recently had a batch of ore worked that paid \$370 per ton. Barium & Bronson are working the Basin, and getting rich ore. The Milling mine has just been sold, and is suspended. The vein is large, and shows four inches of \$1,200 ore on the foot-wall. We summoned up our impressions of Humburg district by deciding that it shows more rich minerals for the work done than any district we know of in Arizona.

VALENCIENA.—The Valencierna is well known to all old settlers, having been worked at intervals by different owners since 1848, and yielded thousands of dollars. The gold from it is very pure, worth from \$18 to \$10 per ounce. The owners intend to work arrastras to start on, and hope to get some parties with mills or means to put up a mill at Swilling's ranch, only six miles south of the mines, where there is, even at this dry season, a splendid water-power, to take out 30 tons of ore per day with 15 men, and the 20-stamp mill of the company is being constantly kept in motion. The last

## Dakota.

BLACK HILLS ITEMS.—Deadwood Pioneer, Aug. 3: There are now 20 black hills running in the Hills, and seven more on route between here and Sidney. Fifty tons of the Blacktail ore, crushed in the Pearson mill, the clean-up being made on last Thursday, yielded \$260, about \$13 per ton. The Hidden Treasure is now taking out 30 tons of ore per day with 15 men, and the 20-stamp mill of the company is being constantly kept in motion. The last



### The Big Horn Mine.

A correspondent of the *Salt Lake Tribune*, writing from Camp Stambaugh, July 27th, gives the following opinion of the Big Horn country: This post is located about 100 miles from Green river on the road to the Wind river and Big Horn country, which is believed by many people to contain rich gold diggings. My object in writing this is to inform your readers that if there is any gold here it is yet to be found. I have talked with hundreds of returning prospectors, and they all tell the same story. None of them ever brought back one dollar. I have talked with almost all the old settlers along the road, and have yet to find the first man who says he ever knew of any one finding gold in that country.

### The Big Horn Gold Fields

Are a fraud; there is nothing in it. One and a half miles north of here is the Miners' Delight mining camp. The mine from which the camp derived its name was at one time, some eight or nine years since, considered one of the richest gold mines on the continent. After lying idle all these years, it has passed into the hands of men who mean business. Among them is Colonel Nuckolls, of your city. The company has torn down the old hoisting works, and have just finished new ones, the largest and most complete in the Territory. They also have a ten Cornish pump, which will be lowered today, and he set in motion to-morrow, under the supervision of S. B. Davis, of Salt Lake.

Aside from the above named improvements, this country is away down, without money or enterprise. A few people work placer claims, which pay from \$1 to \$3 per day. Perhaps a few pay more. But I think they all come under the head of China diggings, although there is not a Colossal in the country. You are wearing summer clothes, and I am writing this with an overcoat on.

### The Columbia River Salmon Industry

Not alone with wheat do fleets go laden from this coast. We have other resources, rich and rare; among them is the salmon catching and canning of the Columbia river. Our readers have already had some details of this great industry, but at this time we are enabled to give some little sketches which will, perhaps, impart a better idea to those at a distance, of the means and methods employed. In this effort we shall be greatly aided by an article on the subject which lately appeared in the *West Shore*, a handsome illustrated newspaper, published at Portland, Oregon. From this source we learn that the number of people employed in the different industries of catching and canning, with their attendant arts and ministries, is fully 10,000; and that the value of the produce which will be exported this year will probably reach \$5,000,000. Further comment on the importance of such an industry is not needed.

The first salmon canned on the Pacific coast came from the Sacramento river, and were put up at Washington, opposite the city of Sacramento. The company engaged in it consisted of George and William Hume and Mr. Hapgood. Owing to a lack of experience, the enterprise did not prove a success. Old trappers and hunters had often, within hearing of the Humes', spoken of the wonderfully large and fat fish to be caught in the Columbia river, and at last, in 1865, George started for the then far-off country. On his arrival here he found N. H. Nice and Joachim Reed engaged in fishing extensively, preserving their fish by salting. George secured a location on the river, and the name he then gave it, Eagle Cliff, it retains to this day. After erecting suitable buildings, William Hume and Mr. Hapgood arrived there with the apparatus from the Sacramento river, and the first canning of salmon on the Columbia commenced in 1866, by the firm of Hapgood, Hume & Co. This firm finally dissolved, and each member started a separate cannery. After that nearly every year saw the erection of least one new establishment. Besides the canneries, there are numerous salting establishments along the river, which preserve and export a limited number of salmon every season, salted and packed in barrels. In appearance, all canneries look nearly alike. We show an illustration of one at Upper Astoria, which gives a very correct idea of an establishment of that kind.

The fishing season proper usually lasts from May to August, for a period of about 120 days. The Columbia river salmon, as shown in our engraving, when captured just as they come from the ocean, may be supposed to be exactly ripe, and the peculiar temperature of the water, ice-cold at all seasons, fed by the melted snows of the mountain regions, seems especially adapted to maintain the fish in the best condition.

The fishing boats usually leave at 4 p. m., returning about 4 or 6 the next morning. The fishing is mostly done at night. The salmon knows a net when he sees it, and will avoid it in day time. The boats, as shown in the engraving, are built something like the Whitehall, only much heavier. A boat's crew consists of two men, one for pulling and the other to pay out or take in the net.

The nets are made of Barber's shoe-thread, nine to eleven threads to the strand, and the meshes are eight and a half inches, so that no small fish can be caught. The nets are from 200 to 240 fathoms long (a fathom is six feet), and, floated with corks and weighted with lead, fall as much as 20 feet into the water.

The way the nets are set is to throw one end,

held up by means of buoys, and to row in a straight line across the river, so as to stretch it at right angles with the stream, and then allow it to drift down with the current. The fish, swimming against the stream, are caught in the gills, becoming entangled in the meshes. Just as soon as the fish are caught, if not drowned in the net, they are killed by a blow on the head. The average weight of salmon is 20 pounds. When brought to the cannery the fish are piled upon the wharf, and we have seen 1,500 salmon in a single pile. From this pile they are taken to a trough, thoroughly washed and placed on a long table; here, with a single blow of a huge knife, the headed is severed and with a skillful single motion of a similar knife, the fish is split open and disemboweled. The head and entrails are thrown away at many of the fisheries; at some of them, however, they are made into a very good article of oil. After the fish are cleaned, they are thrown into hline vats, where they remain for a time—this process is known as sliming; they are now taken and placed, one at a time, on a small table with a cutting attachment, and with a single stroke of the lever, the fish is cut into exactly the proper size to fit into the cans.

Another set of hands take these bits of fish, place them deftly in the cans, whence they go to other workmen, whose duty it is, by means of an apparatus, to put in each can a small amount of brine, for canned salmon have nothing else in it, being cooked *au jus*. Now, the cans filled with the raw fish, pass to workmen who apply the lid and solder it on. Next, the cans are placed, hundreds together, in iron rings, or, in some of the canneries, into iron squares, each form holding about 600 cans, and by means of cranes all are lowered into steam boilers, where they are cooked for an hour. Now, quite a nice operation takes place, similar to that employed by the champagne-wine manufacturers, which is called venting. A hole is pricked in the top of the can, and the air and



AT WORK ON THE RIVER.

road continues southeastward to Tashkent in Kokhan, about 800 miles—through swamps and deserts, over mountains and rivers, which require enormous bridging, tunneling, piling, and excavating, and thence eventually into Cashgar, where an intersection is made with the contemplated road from Ormus, in the Gulf of Persia, which, crossing Afghanistan into Cashgar, is aimed toward Peking. The route runs a little north of that originally devised in eastern Europe, and east of that formerly outlined in western Asia.

### THE ENGINEER.

#### New Asiatic Railway.

In the midst of war the Czar finds opportunity to plan for bettering Asia with a railway. The *Railway World* says that he has given formal sanction to the construction of the Central Asian railway which undoubtedly means the immediate commencement and vigorous prosecution of that great work—the full equivalent to our Pacific railway. The Czar would hardly have stepped beyond the duties devolved upon him by the existing war to authorize so great a project unless action was intended; and the reasons which inspire a beginning are potent to require completion.

The road commences at Moscow and is fully completed to Samara on the Volga, through Lower Novogorod, 600 miles. Running south-

eastwardly from Novogorod through Samara it reaches Orenburg on the Ural river, 600 miles, then follows a curve of that river due east to Orsk, which is 150 miles east from Orenburg, 300 south from Ekaterinburg, and 600 from the Caspian by the windings of the Ural. This is the termination of the European and the beginning of the Central Asiatic road, about which so much has been said for a long time.

From Orsk the road continues southeastward to Tashkent in Kokhan, about 800 miles—through swamps and deserts, over mountains and rivers, which require enormous bridging, tunneling, piling, and excavating, and thence eventually into Cashgar, where an intersection is made with the contemplated road from Ormus, in the Gulf of Persia, which, crossing Afghanistan into Cashgar, is aimed toward Peking. The route runs a little north of that originally devised in eastern Europe, and east of that formerly outlined in western Asia.

### A New Kind of Railroad.

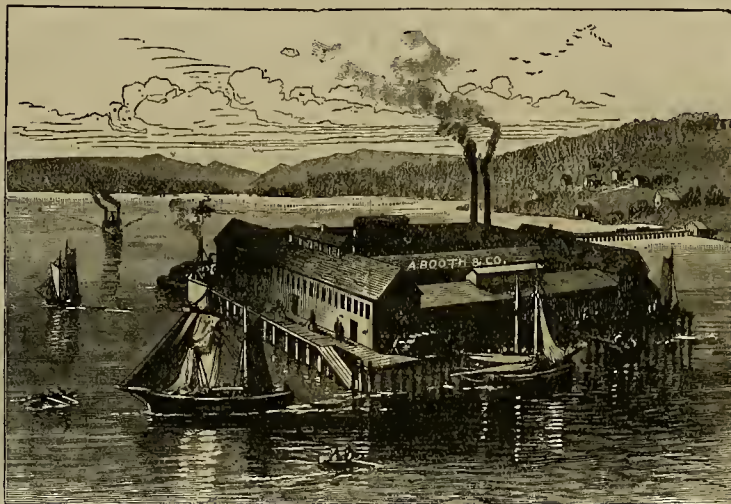
The proposed plan for a new kind of railroad is called the "Pioneer Railway," and the *Engineering News* says it consists of a low fence of continuous girder, constructed of wood or iron, as desired, supported on edge upon posts or pillars, and surrounded by a single rail (not a single line of rails); the engine, coaches and cars running on this rail, and sitting astride of the fence, after the fashion of the panniers or packs on a camel or mule. At any incline up to one in ten is possible, in consequence of the method of driving adopted; no expensive surveys are required, nor levels, except of the most simple kind. It is estimated that with the railway made entirely in iron the cost will not exceed \$7,500 per mile, including the proportion of rolling stock. By abandoning entirely the use of vertical adhesion this system is entirely independent of weight, in as far as driving power is concerned, and hence locomotive engines can be made as light as is consistent with obtaining the necessary power from them. The horizontal grip is given by mechanical appliances, which affords the means of varying the amount of pressure at will in proportion to the gradient to be traversed, and therefore to the load to be drawn. A light locomotive engine on this system means a light construction of road, but not necessarily, as in the narrow gauge systems, a seriously diminished proportion of traffic hauled by it. The weight is, as nearly as possible, uniform throughout the train, and amounts, when loaded, to from 15 to 25 cwt. per wheel.

**THE SUBMARINE CABLES OF THE WORLD.**—The *Polytechnic* translates from foreign authorities as follows: There were 206 cables laid, having a total length of 80,000 kilometers, by the end of 1874, and 269 was the number of cables in position in 1876, representing a length of cable equal to 63,989.78 nautical miles. The entire network of submarine cables is owned by 21 private organizations and 17 governments. These 21 private companies own 149 cables or a length of line equal to 59,547.55 nautical miles. The most influential of these companies is the so-called Eastern Telegraph Company, which alone represents 39 cables of a total length of 14,502.75 nautical miles. The next largest is the Anglo-American Company, 17 cables of 12,315.12 miles in length. Of the governmental companies, the Indo-European has six cables of 1,721 miles length, France has 26 cables having a length of 673 miles, Germany 21 cables with 149.25 miles of line. Of the entire number of cables 45, with 20,895.12 miles length, are worked independently by the St. Petersburg Telegraph Company; the others are either entirely or in part worked in accordance with specific contracts made.

**A NEW LIVERPOOL.**—Bristol, England, is to become the rival of Liverpool, if engineering skill and a liberal outlay of money for improvements can do anything in the way of inducing commerce to center there. The river Avon has been deepened, its dangerous angles cut off, and a large dock built at Portishead, at a cost of over \$4,000,000. Another dock for the city has been built at the mouth of the river Avon, a few miles below Bristol, and with its warehouses and plans cost \$3,000,000. These great works are in direct communication with the Great Western and Midland railway systems, and with numerous coasting steam lines running to and from Bristol. The Anchor line of steamers have taken advantage of the opening of the Avonmouth dock to establish a line of passenger and freight steamers between New York and Bristol, and the new route has just been opened by the sailing of the *Olympia* from New York for Bristol.

**ENGINEERING IN INDIA.**—The question of the permanent restoration of a great bridge carrying the Bombay, Baroda and Central India railway over the Nerhudda river, 1,560 feet for which were carried away by heavy floods in September, 1876, has been receiving much consideration; and it has been decided to erect an entirely new bridge just above the old bridge on a design furnished by Sir J. Hawkshaw. A contract has been entered into for the manufacture and delivery in Bombay of the materials for the new bridge, which will consist of 25 spans of 187 feet 6 inches on piers of two large iron cylinders. Until this new bridge over the Nerhudda is available for traffic, trains will continue to pass over the old bridge, crossing the gap by a temporary structure, which has been erected with skill and promptitude by the Bombay, Baroda and Central India Company's engineers.

**IRON AND WOODEN BRIDGES.**—At the Rigollets, a stream connecting lakes Pontchartrain and Borgne, there is a bridge 3,600 feet in length, which has just been rebuilt by the Phoenixville Bridge Company, who are renewing all the larger bridges with iron on wooden foundations. The piles which constitute the foundations are from 80 to 95 feet in length, and are driven from 30 to 40 feet into the earth. They are of yellow pine, and are filled with creosote before being put in place, each one being treated to a dose of 300 gallons, or from two to three gallons to each cubic foot. This process consists of the steaming of the timber under a pressure, after which a vacuum is created and maintained as long as any juices will flow, when the creosote oil is introduced, and a pressure of 150 pounds to the square inch is maintained as long as the timber will continue to absorb the oil. Timber thus treated is believed to be virtually indestructible.



A SALMON CANNERY AT ASTORIA.

gases generated are allowed to escape, when the little venthole is instantly resoldered. A second cooking now takes place, when the culinary portion of the canning is ended. The cans are again taken from the boilers, and are showered with cold water. If the vacuum is perfect and the package sound, the top of the can caves in and assumes a concave form.

**ST. GOTHARD.**—A conference recently held by commissioners representing Germany, Italy,

The authorized plan secures Turkestan and strengthens Russian conquests there, but gains no outlet on, and makes no approach toward, the Pacific. It may be that the original and greater enterprise is left for a pacific day.

**BACKING FOR EADS.**—Gen. Beauregard has written a letter highly commending Capt. Eads and his work on the jetty system at the mouth of the Mississippi. He suggests to all persons interested in having ample water for com-



THE COLUMBIA RIVER SALMON.

and Switzerland, with reference to the present position of the St. Gothard railway (and tunnel) has come to the conclusion that the original plans must be modified and reduced. The St. Gothard railway, properly so called, is proposed to be proceeded with, but sundry affluents are to be abandoned for the present. Notwithstanding this abandonment, additional capital is still required to the extent of £1,840,000.

cial purposes at the mouth of the Mississippi, to bear with patience an occasional *contretemps*, instead of lending a willing ear to all the unfavorable rumors which are set afloat concerning the work. Morally, if not materially, they should encourage the engineer "who has staked his reputation and the means of himself and friends on the accomplishment of an undertaking which is ere long to make of New Orleans the greatest grain shipping port in the world."



## Leeds District.

But slight progress has been made in the development of our mines since my last report. However, all the leading mines mentioned heretofore continue to present their usual fine appearance; and now that the

## Rock Cliff Mill

is completed, and is in successful operation, mine owners are preparing for a largely increased production of ore.

This mill (the Hunter-Goss) is running on Emily Jane and Stormont ores, of which about 20 tons per day is being reduced; and from appearances, the yield of these mines bids fair to monopolize the reducing power of the mill to such an extent that more custom mills will be required to accommodate the yield of other valuable mines.

This mill, 10 stamps, when running at maximum speed, is capable of reducing 50 tons per day, and Mr. Goss assures me that even 60 tons could be disposed of within that time. Twenty-two tons of Stormont ore was passed through the battery yesterday in 11 hours, which I will venture the assertion is, by far, the most rapid work ever attained by a mill of like size.

No bullion shipments have yet been made, but battery samples indicate the ores from the mines mentioned above, to be of the value of about \$140 per ton.

It is confidently believed that the entire reducing cost of these ores, by this mill, will not exceed \$4 per ton, and that 93% of the assay will be realized.

## Bullion Shipments

Per Wells, Fargo & Co., for the month, are a little more than \$40,000, of which \$3,000 is accredited to the Leeds mining company, about \$6,500 to Dupax, \$2,500 to Tischer & Co. and \$1,000 to the Stormont and Emily Jane company.—*Cor. Salt Lake Tribune.*

## Emigrant Gap.

We made a short call at Emigrant Gap on the 29th ult., and were somewhat surprised at seeing the lively manner in which business is being conducted in that little "burg;" and especially when we consider that heretofore the only industries of the Gap were thought to be its extensive forests of timber, which were being rapidly converted into wood, shakes, stave-holds and all kinds of lumber; and as those industries are nearly at a standstill the present year, others have sprung up in the shape of gravel and quartz mining, which bid fair to add fame to the little town among the rocks for years to come. We were made sensible of the fact that gravel mines have been discovered in the vicinity of Emigrant Gap, which are being worked and producing considerable gold, by seeing the miners disposing of their gold dust in lots suitable to make their necessary purchases of provisions, clothing, etc. Those mines as yet are only being worked on a small scale, but as good prospects for extensive hydraulic mines have been discovered in several places, we may expect to hear soon of their being worked in the most improved modern style. The quartz ledges discovered on Saw Mill Flat, south of the Yuha river, and two and one-half miles north of the Gap, are said to be looking splendid. Although some of these locations were made years ago, they have not received any special attention until recently. The Colman Brothers, of Grass Valley, are the owners of some of the principal ledges, and have about 50 men at present in getting out ore and erecting a quartz mill, which will soon be in use crushing the rock. Several other companies are prospecting ledges recently discovered.—*Dutch Flat Forum.*

**SPRING VS. DITCH WATER.**—The spring water heretofore used in the tuyeres at the Consolidated works, from the fact that it is strongly impregnated with limestone, has caused a great deal of trouble, the incrustation forming in the tubes preventing the water from circulating freely, and in consequence the intense heat, where the ends project into the furnace, burns the iron, and, unless quickly removed, the leakage is apt to form "sows," or large masses of chilled iron, deranging the internal processes and reducing the smelting capacity. Colonel Taylor has been experimenting with the water that runs down the canyon, and finds that its exposure to the atmosphere and settling in the reservoir opposite the office, removes a large portion of the foreign substances and renders it much better for use in the works. It is now about a fortnight since water was used from this source, and no trouble with incrustated or burnt tuyeres has been experienced since that time. The water is turned into the reservoir from the ditch and then pumped into a tank above the boilers, from whence it is carried in pipes to the furnaces.—*Eureka Sentinel.*

**BIG GOLD NUGGET.**—Mr. Rufus Snyder informs us that Messrs. Collins, Snyder & Co., operating in French Gulch, Summit county, have found a nugget weighing 22 ozs. 3 dwts., which, at \$16 per oz., a low valuation, is worth \$354.40. This was found in the "Wire Patch." Nuggets worth from \$3 to \$10 are quite common, but this is the largest nugget found for several years. At the last clean-up it was found that the company had made \$60 per day to the hand, and late reports say they are now doing better than before. Col. Fuller's operations are also highly successful, but we are unable to give exact figures.

## USEFUL INFORMATION:

## Notes on Lacquering.

All have admired the beautiful lacquering seen on the wares brought from across the Pacific, but few know how the work is done. The *Hub* has taken pains to gain this information. We read as follows: "Lacquering" is a specialty with the Chinese and Japanese. The latter assert that the art had its origin in 724, and that as early as 1290 it had attained a considerable degree of excellence, and a school was established in this branch of art named after a skillful painter of that age. The clear pure varnish, which forms so important a material in the work, is obtained largely from the gum of the tree *Rhus vernicifera*, a native of Japan and Nepal. The juice, flowing from the tree when wounded, becomes thick and black by exposure, yet continues so transparent that the finest tracery is visible through it.

In beginning a decoration in lacquer, the first step taken by the Japanese is to trace out, on the thinnest of paper, the required pattern or design, and the tracing is then gone over with a bamboo spatula. The outline thus left is now gone over with a particular kind of soft lacquer varnish. When this is done in hot weather, the varnish speedily dries, and, consequently, where the pattern is a good deal involved, a small portion only is executed at one time, and the gold powder, which enters largely into the lacquer-ware for the foreign market, is applied to each part as it is being executed, a large and very soft brush being used, and by its aid the gold powder is well rubbed in with the lacquer or varnish. The work is then left to dry for about 24 hours, after which the pattern is lightly rubbed over with charcoal made from a particular kind of wood, and this process produces evenness of surface. The work is next rubbed with polishing powder and afterwards carefully wiped. The outlining being done, there still remains a good deal of finishing work, such as tracing the leaves of trees, the petals of flowers, the wings of birds, etc. Into all this gold powder largely enters, the working in of which requires a light and skillful hand. The Chinese appear to work differently. The varnish they use is made from the sap or gum of a native tree which is dark-colored like molasses. Oils are mixed with this which give it fluidity and a lighter color, but it is considerably thicker than our varnish, and can only be applied with a swab of tow. It has a poisonous effect on foreigners, causing something like our lead colic. The health of the native does not suffer, however, except when it is spattered on his lips or in his eyes. It must only be applied in damp weather, and cannot be used in this country.

Another of the Chinese lacquers is made as follows: Take two parts of gum copal and one of shellac; melt them together until entirely fluid; add two parts of hot boiled oil, and when all these are well incorporated, the vessel must be taken from the fire, and 10 parts of oil of turpentine be added, stirring it in gradually. A little dragon's-blood will give it a red tint, or a little gum gutta will tinge it yellow. All the lacquered work of China and Japan is polished, and Americans have no idea of the great amount of labor expended upon this process. Luckily (?) in that country labor is very cheap. In America we could not afford to do such lacquered work, even if we knew how.

**UPHOLSTERING OLD CANE CHAIRS.**—When the cane seat of a chair is broken, it may be made as good as new, or better, by upholstering it at home. As described by the *Journal of Chemistry*, after removing the superfluous bits of cane, cover the space with matting formed of three-inch-wide canvas helting woven together. Tack it temporarily in places. After placing over this some coarse muslin, draw both smooth, and secure at the edge with twine, making use of the perforations. Remove the tacks, turn the raw edge over toward the center, and baste it down. Arrange the curled hair and wool, or whatever you propose to use for stuffing, and keep it in position by basting over it a piece of muslin. Then carefully fit the rep, pin it in different places until you are certain it is in perfect shape, and tack it permanently—following, of course, the tracing made for the cane. Cover the edge with galloon to match the rep, using tiny ornamental tacks, and tie with an upholsterer's needle in as many places as is desirable, leaving a button on the upper side. When the back of the chair is to be repaired, a facing must be tacked on the outside.

**DESIRABLE TIMBER.**—Greenheart, a variety of timber that grows largely in British Guiana, is a hard, close-grained wood, containing a considerable amount of oil, like teak. Its specific gravity is about equal to that of oak, but it is decidedly superior to it in strength, toughness and durability. These, however, are not its chief advantages, its great value consisting in its complete exemption from the attacks of marine worms. It is, therefore, an excellent timber for sluice gates, piles, and all marine engineering works, which would be exposed to their ravages. British Guiana also furnishes morra. This tree grows to a very great size, often attaining a height of 100 to 150 feet, the lowest branches being 60 feet from the ground. The wood is extremely tough and close grained, which properties make it difficult to split, and render it peculiarly applicable to ship building purposes. It is also little subject to dry rot.

**CORIAN PAPER.**—Corian paper, says the *Paper-Trade Journal*, is made of the bark of the mulberry tree, and is used by the wealthier classes in Manchuria and North China instead of glass for covering windows, for making umbrellas, etc. It resembles Japan paper. Its great strength and imperviousness to damp and the size of the sheets are worthy of special notice. Indeed, it is well known that the making of paper is one of the chief industries of the still isolated kingdom of Corea. It finds its way into China through the three annual fairs which are held near the boundary between the two countries. The strength of Corian paper is owing to the fact that the material is not weakened by being subjected to the action of lime for the purpose of whitening it. The paper which the Coreans use for dispatch writing it resembles in strength and color, but it is often thicker and it is polished on both sides.

**OXIDIZED SILVER.**—The color of so-called oxidized silver, says the *Mining Journal*, does not depend on oxidation, but on sulphurization. The silver goods are dipped into a boiling hot solution of calcium sulphide or hyposulphite of soda, or into ammonium sulphide, until they have taken the proper color. "Old silver" is a coloration produced by laying on a mixture of black lead and oil of turpentine, or some fatty matter, and cleaning off with blotting paper until no more color comes away. Copper acquires a handsome look if treated in the same manner. If it is desired to varnish oxidized silver, take 18 parts alcohol, three red arsenic, and one castor oil, and a non-transparent varnish can be made, which may be diluted with its own volume of alcohol, if a particularly thin coating is wished.

**IMITATION NICKEL PLATING.**—As nickelizing is replacing silvering in some cases, so there are some where nickelizing may be itself replaced for many articles of small value, such as pins, particularly if they contain copper. The manipulation is very simple. Coarse rasped or granulated zinc is boiled for some time in a mixture of three parts by weight of sal-ammoniac and ten of water; the objects are immersed and stirred with a zinc rod. The deposit is silvery bright, and resists mechanical action as well as a coating of nickel. The process can be recommended for goods which are meant for a second coating of some other metal, since any other is easily deposited upon zinc.

**SAVING HEAT.**—A composition of very thin flour paste, thickened with clean sawdust, it is said, makes a very good coating for steam pipes and boilers, to prevent loss of heat. It adheres very firmly to iron, but on brass or copper it is necessary to apply a very thin coat of fuller's earth, when the paste will adhere with sufficient tenacity. Out of doors, it is advisable to give a few coats of coal tar, after the necessary number of coats of the sawdust paste, to make the covering waterproof. About five coats of the paste will be found to be sufficient, and each should be allowed to dry perfectly before the next is applied.

## GOOD HEALTH.

## Helping Nature in Cures.

The *Journal of Chemistry* has an article maintaining the strength of nature to throw off many troubles if she is given but a fair chance to do it. We quote a few paragraphs: "The 'cure' of diseases is rendered possible by certain conditions which, alas, are too often wanting in both adults and children. Medicines (a term applied to certain substances, vegetable and mineral), if intelligently employed, are of service to the physician in the care of the sick. The indiscriminate use of drugs will not, however, cure disease, but will, on the other hand, certainly aggravate and complicate every form of physical and mental derangement. The notion that there are simple or compound agents adapted to remove physical ailments under all circumstances is fallacious and absurd. Cures, so called, do not often result from the use of remedies alone, but from nature's efforts, assisted by proper dietary and sanitary regulations. The tendency of nine-tenths of all disease is towards recovery. It is astonishing how tenaciously life clings to the frail body, when it is racked with pain or consumed with fever. Body and spirit part only after a desperate conflict, in the usual forms of disease. The conflict is between the chemical forces on the one hand, and the vital forces on the other, and the destructive chemical forces are most frequently beaten in the fight. It is through vital action that the spirit makes defense, and by it not only are all the strongholds of the body defended, but also the outposts, where the slightest danger is possible. If through habits of life or from accident the vital powers are weakened, then chemical action begins; and when death ensues it obtains complete mastery over all that is perishable, and its assault does not cease until every portion of the body is resolved back to the inorganic world from which it came.

The important lesson to learn is how to help nature in her efforts to cure for us. If the indestructible part of us does not act harmoniously, we are soon forced to yield the body to decay; body and spirit part company. Sound health, which comes from an observance of nature's laws, is the greatest earthly blessing. There is no occasion to talk of cures where there is no disease;

and whilst it is impossible for us to live superior to accidents, it is possible to help nature better than we do in her care of our bodies.

**REMEDY FOR INSECT BITES.**—We read the following in an exchange, and shall give it a trial: When a mosquito, flea, gnat, or other noxious insect punctures the human skin, it deposits or injects an atom of an acidulous fluid of a poisonous nature. The results are irritation, a sensation of tickling, itching, or of pain. The tickling of flies we are comparatively indifferent about; but the itch produced by a flea, or gnat, or other noxious insect, disturbs our serenity, and, like the pain of a wasp or bee sting, excites us to a remedy. The best remedies for the sting of insects are those which will instantly neutralize this acidulous poison deposited in the skin. These are either ammonia or borax. The alkaline reaction of borax is scarcely yet sufficiently appreciated. However, a time will come when its good qualities will be known, and more universally valued than ammonia, or, as it is more commonly termed, "hartshorne." The solution of borax for insect bites is made thus: Dissolve one ounce of borax in one pint of water that has been boiled and allowed to cool. Instead of plain water, distilled rose water, elder, or orange flower water, is more pleasant. The bites are to be dabbed with the solution so long as there is any irritation. For bees' or wasps' stings, the borax solution may be made of twice the above strength. In every house this solution should be kept as a household remedy.

**CURE FOR A SCALD.**—A scald is most painful, it matters not whether it comes from a huge steam boiler or a cabbage-kettle, and a cure should be borne in mind. Dr. Waters, of Salem, recently showed before the Massachusetts Dental Society that bicarbonate of soda, such as used for cooking purposes, or any other alkali in neutral form, would afford instantaneous cessation of pain from the severest burns and scalds, and would cure such injuries in a few hours. Deliberately dipping a sponge into boiling water, the doctor squeezed it over his right wrist, producing a severe scald around his arm and some two inches in width. Then, despite the suffering occasioned, he applied the scalding water to his wrist for half a minute. Bicarbonate of soda was at once dusted over the surface, a wet cloth applied, and the pain, the experimenter stated, was almost instantly deadened. Although the flesh on the wrist was literally cooked down to the sweat-glands, and the wound was of a nature to be open and painful for a considerable time, on the day following the single application of the soda the less injured portion was practically healed, only a slight discoloration of the flesh being perceptible. The severe wound in a few days, with no other treatment than a wet cloth kept over it, showed every sign of rapid healing.

**THE APPETITE.**—To know when and how to follow the instinct of appetite, to gratify the cravings of nature, is of inestimable value. There is a rule which is always safe, and will save life in multitudes of cases, where the most skillfully "exhibited" drugs have been entirely unavailing. Partake at first of what nature seems to crave, in very small quantities; if no uncomfortable feeling follows, gradually increase the amount, until no more is called for. These suggestions and facts find confirmation in the large experience of that now beautiful and revered name, Florence Nightingale, whose memory will go down with blessing and honor, side by side with that of the immortal John Howard, to remotest time. She says: "I have seen, not by ones or tens, but by hundreds, cases where the stomach not only craves, but digests things which have never been laid down in any dietary for the sick, especially for the sick whose diseases were produced by bad food. Fruit, pickles, jams, gingerbread, fat of ham, of bacon, suet, cheese, butter-milk, etc., were administered freely, with happy results, simply because the sick craved them."

**SUPERB VENTILATION.**—This morning we happened to remark to one of our city physicians that the concert last night was very good, to which he replied warmly: "It was, indeed, most excellent, the best thing of the kind that ever happened in San Antonio."

"But how do you know all that; you were not there, were you? we wanted to know."

"I know I wasn't there, but I happen to know that nearly everybody that was there is under treatment for rheumatism, neuralgia, pleurisy or influenza. I have about fifteen cases myself, and all respectable people who pay their bills. The performance was truly excellent."

It was very chilly in that hall last night. There is no mistake about that. The ventilation was superb.—*San Antonio Herald.*

**LIFE AND DEATH.**—One-half of the human family, says *Hall's Journal*, dies under 17 years of age. Nine-tenths of all who are born ought to complete their "threescore years and ten," because nine-tenths of all diseases are avoidable by the steady practice of temperance and such out-door activities as are encouragingly remunerative. There is a still more specific method of lengthening life in healthfulness and vigor, and one which is practicable by the masses. Colds or constipation immediately precede or attend almost every case of ordinary disease. The latter can be antagonized by abstinence, cleanliness and warmth for 36 hours; and a cold need not be taken once a year if three things are attended to: Avoid chilliness, damp clothing, and cooling off too soon after exercise.



# MINING SCIENTIFIC PRESS

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Our latest forms go to press on Thursday evening.

SAN FRANCISCO:  
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## The Week.

All the "strike" excitement has died away and quiet reigns once more. In the East some of the Pennsylvania miners are still turbulent, but on this coast there is no trouble. Several items of importance in connection with the mining interests have developed themselves this week. Prominent among them is the cessation of work in the new tunnel on the Mariposa estate (noticed elsewhere in this issue), caused by a foreclosure suit. This has been expected for some time by those well informed of the condition of affairs, but it is very hard with miners who are thrown out of work. A strike is announced in the El Dorado South mine at Belmont, where, while raising a chute from the lower level, they found some antimonial silver ore assaying from \$300 to \$800 per ton.

A rich gold-bearing ledge is reported as having been discovered in Broad canyon, in the Toiyabe range, about 50 miles from Austin, and there is considerable excitement in Jefferson and that part of Nye county, over it. Within the past few days an amicable adjustment has been made of the litigation between the De Fries and Grand Prize mining companies, the latter company agreeing to deed the former the "debatable ground" after obtaining a patent for it. After an interval of several months the La Grange ditch company has declared a dividend of 25 cents per share. Another mine has been added to the dividend-paying roll this week. This is the Leeds mine of Utah, where reduction work was commenced last February. There are 60,000 shares, and the dividend just declared is 20 cents per share, aggregating \$12,000, payable on the 20th.

## Prospecting.

The shutting down of numerous mines, and the reduction of force in some of the large ones in Nevada lately, has had the effect of setting a lot of miners on their own resources. In many cases this has, of course, caused distress, especially where the men had families to support and could find no other employment. In most of the larger camps, where the companies have been compelled to reduce expenses, this state of affairs exists to a greater or less degree, so that the mere change of location from one place to another is of little or no benefit. On the Comstock, although there are 3,516 men at work at four dollars per day, receiving in the aggregate \$14,064 per day, there are also 3,000 idle miners there. A large number of them have left for other places, and finding the same state of affairs, have been compelled to do the best they could.

Under these circumstances, the ranks of the prospectors have been materially swelled, more especially in California. Men who could find nothing else to do found it better to start in and prospect than to lie about idle. Although the cause is to be deplored, the effect has, in a measure, been productive of good, for a great many claims have been found within the past few months, and are now being worked by their owners.

In Nevada, Sierra, Plumas, Placer, and adjoining counties, the prospectors have been roaming over the hills and through the gulches, looking for anything which would give them a living. Claims which the miner of early days would have passed by as worthless, have been taken up, prospected and worked, and answered the purpose of giving a living to from two to half a dozen working miners, and in some instances rich strikes have been made. Mines worked ten or a dozen years ago and abandoned have been reopened, and when worked by the owners themselves for their own interests, have been found to afford at least a living, and often more.

There still remain many places where energetic prospectors have an opportunity to try their luck. It does not take much money or much of an outfit to start on a prospect. Men in this occupation live at very little expense, indeed much cheaper than they can when boarding or living otherwise in the towns. Prospecting, properly done, is by no means easy work, as many a long weary tramp has to be taken with unfruitful results, and many hard blows must be struck in vain. Still, there is always the hope present that the claim in hand may be valuable, or that this or that gulch may have enough left in it to pay for working. Again, there is always the chance open to every one of striking something rich, which will place the lucky owner in a position difficult to attain by working for days' wages alone. The prospector, if he has any money at all, is as independent a man as can be found. His necessities are small in the matter of food, and smaller still as regards clothes. His tools are inexpensive and durable, and if he does strike anything, he is no longer compelled to seek the good offices of some superintendent for a chance to earn his daily bread.

Our miners should see cause to thank their stars that they are in a country where the precious metals abound, and where there is an opportunity to better themselves. In the East the position of the miner is much worse than here. If they lose a job, they cannot go to work and prospect for coal and iron, for it would do them no good if found; but here, if a claim with gold ore is unearthed, the owner can work it himself on a small scale, and at least earn a living. Our miners are by all odds better off than those in the Eastern States, where great distress prevails.

## A Metric Cup.

L. B. Healy, of this city, has patented, through the MINING AND SCIENTIFIC PRESS Patent Agency, a "metric cup," which forms a simple and convenient device for illustrating the decimal system of weights and measures. It consists of a measuring cup, having a holding capacity equal to one kilogram of water, liquid measure, while its exterior measurement coincides with a cube whose edge is one-tenth of a meter, lineal measure, representing the capacity of a liter, solid measure, and in which the area of one of its sides is a square decimeter equal to one-millionth part of a hectare, superficial measure.

The area of each side or face of this cup is equal to a square decimeter; that is, each of its four edges is one-tenth of a meter in length, so that the cube represented by the square is equal to one liter, or one-thousandth of a stere. Now, according to the metric system of weights and measures, one kilogram of water weighs one liter, so that a cubic quantity of water equal to the cube represented by the exterior of the cup represents one kilogram. This cup will therefore contain one kilogram of water minus the quantity of water displaced by the thickness of the sides of the cup. To remedy this difficulty the handle of the cup is made hollow, so that it will contain a quantity of water equal to the quantity displaced by the sides of cup,

thus providing a measuring cup that will contain one kilogram of water at the same time that each of exterior surfaces represent a square decimeter, while the cubic measurements of the cup represent a liter. The sides of this cup can be marked, if desired, to represent their measurements, and a scale can be marked on one or more edges, giving the graduations in inches and tenths of a meter; but these features can be dispensed with, as they only serve as instructions to the user to indicate the actual size and measurement of the parts.

## The Labor Problem and the Mines.

The whole country seems to be just now full of men wanting employment. The labor supply everywhere exceeds the demand. This condition of things has frequently obtained in other parts of the world, but never before to the same extent in the United States, and may be said to exist for the first time in California. There is a stagnation in all our great industries, and this, in the Eastern States, not so much because there has been there a great over-production as because the people have, for various reasons, been forced to practice unwanted retrenchment and economy. Fewer manufactured commodities having been consumed, the stock on hand has proved ample for present wants without further immediate production. Hence, factories run short time, or shut down altogether. The practice of greater economy is shown, also, in the lessened importation of foreign goods. Through this curtailment of manufacturing and increased frugality there has been brought about a reduced consumption of coal. By reason of this, large stocks of this fuel have accumulated, throwing thousands of laborers out of employment in the great coal regions, and restricting transportation on the railroads and canals. With their business so restricted these carrying companies have in turn been compelled to diminish the number of their employees in like ratio. And so this process of retrenchment, applied to one branch of business, has reacted upon another, until a general industrial paralysis has ensued, leaving vast numbers of people out of work.

While we on this coast have suffered somewhat from the causes above recited as operating in the East, the present depressed condition of the labor market here is mainly due to the drouth that prevailed during the early part of the year, to the great detriment of our two leading pursuits, agriculture and mining. With the usual amount of rain at that period we should have been moderately prosperous, though it cannot be denied that our present industrial and financial distress can be traced in large part to other causes, some of which have been for a long time in operation.

Stock gambling has seriously crippled or wholly ruined vast numbers of our people. We, like the rest of the world, have of late years been living beyond our income and prospects—have been earning too little and spending too much. These habits, contracted during the flush times, have been continued on into these days of diminished opportunities and reduced wages, very few of the older residents on this coast having been able to accommodate themselves to these new conditions.

As building in the city, upon which, in ordinary times, our white male population largely depend for employment either directly or indirectly, has almost ceased, we have now an unusually large number of this class out of work. The men more or less affected by dullness in this line of business consist of carpenters and joiners, lathers, masons and their attendants, painters, plumbers, teamsters, lumhermen, brick and lime burners, iron molders, etc. As building is not likely to soon regain its wonted activity, these classes must necessarily look elsewhere for something to do.

Now, it occurs to us, there ought to be many places throughout the mining regions of California where men like these, able and willing to do all kinds of hard work, would be able to earn small wages, either working for themselves or others. There are certainly many spots in the placer mines of this State that would yield a dollar or two per day under well applied, persistent labor. Old miners must know of many such places, and might, through the local newspapers, advise the public as to their whereabouts, as they will probably never care to work themselves. Many of these miners have also claims that they might like to have worked on shares, and in that way may realize something from them, instead of allowing them to lie idle and unproductive. If these parties will, through the local press or otherwise, bring such facts home to our knowledge, we will publish them for the benefit of all concerned.

Again, this is a favorable time of the year for companies contemplating the building of new ditches, flumes, reservoirs, bed-rock tunnels, and similar works, to inaugurate the same; an additional reason for undertaking such improvements just now being found in the low rates of wages that prevail. Lumber is also very cheap at present, and there is little doubt but improvements of this kind could now be made at a less cost by forty per cent. than ever before. A good many Chinamen are now being employed in the mines. Could not white men be, to a considerable extent, substituted for these without detriment to the employer?

The low stage of water in the mountain

streams has encouraged the undertaking of extensive river-bed operations this summer. Could not those engaged in these enterprises greatly increase their working force to advantage?

We shall probably have an early winter, and it might be good policy for this class of miners to push work with expedition, and get out as much gravel as possible before the water raises upon them and stops further operations. The season approaches, and has already come with many companies, when the ditches and flumes are to be cleaned out and repaired; when old pipes are to be removed or new laid down; when the pits must be cleared up, and the hydraulic mines generally be put in proper shape for the winter campaign; all of which creates a slightly increased demand for labor.

In response to these inquiries and suggestions, we hope to hear from many quarters of openings and opportunities for the employment of some considerable portion of the surplus labor that has accumulated in this city, and which, the world over, seems just now to be so superabundant.

## Items of Interest from the Mines.

We give below items of interest from prominent mines, most of which are collated from letters of the respective Superintendents on file at the offices in this city:

A new hoisting engine will soon be put in at the Justice mine.

Rapid progress is being made in retimbering the Bullion shaft.

The bullion yield of the Chollar during July amounted to \$34,000.

A great many miners are leaving the Comstock for the mining camps in the eastern part of the State.

Of the total bullion yield of the California mine for July, \$712,166.12 were in gold and \$687,165.67 in silver.

The Matamoras furnace at Eureka, Nev., is producing daily about four tons of bullion, worth on an average \$400 per ton. New developments are reported in the mine.

A sket, weighing 2,700 pounds and having a carrying capacity of four and one-half tons of rock, has just been completed at the Gold Hill foundry for the new Yellow Jacket works.

The Ophir mined 90 tons of ore last week. In the east cross-cut from the bottom of south winze, on the 1800-foot level, they have to keep a drill hole four or five feet ahead for protection against an influx of water.

In the Bullion work has been resumed in the north drift in a formation of vein matter, carrying mineral.

Chollar turned out last week 489 tons of ore, assaying \$22 per ton.

The cross-cuts in the Overman all continue in a very promising character of quartz and vein matter.

In cross-cut No. 3 from 1700-foot level of the Best & Belcher, quite a stream of water comes from the drift. On account of the intense heat no work is being done on the 1700-foot level. For two months the same amount of air now required to run this one cross-cut could run three, and this is attributable to the striking of water so hot as to raise the temperature from 86° to 116° Fahrenheit.

The incline of the Hale & Norcross mine was partitioned last week from the 1700-foot level up to the 8th station.

Eureka Consolidated delivered at furnaces, last week, 760 tons of ore of good grade, and carrying at least 30 per cent. of lead per ton.

The Martin White Co. shipped from Ward district \$35,000 in gold bullion, in July.

The vein in the slope of the Gila is producing very rich ore.

**GOLD MINING IN CHILI**—The placer mines at Catapilco, Chili, which were prospected by Dr. A. P. Burns, last season, for the San Francisco and Catapilco gold mining company, have been sold to La Ligua gold mining company, of New York city, and they are preparing to erect large and expensive hydraulic works. From working tests, the gravel deposits at Catapilco average 50 cents per ton. A 400-horse power engine will be employed to pump the waters from Catapilco lake to an elevation of 450 feet, where over 10,000,000 gallons of water will be deposited in a reservoir every 24 hours. From this reservoir two 15-inch pipes will supply four of Craig's nozzles. The sluices are to be paved or lined with old railroad iron, and all the works are to be first-class in every particular. The new company is a "close corporation," formed principally of Eastern capitalists, who have employed an experienced California hydraulic miner to superintend their works in Chili.

**MINING ACCIDENTS.**—Already this month there have been nine mining accidents on the Comstock, three of them fatal. The names of the victims, so far, are F. J. McDonald, who was killed in the Justice incline; John Henry Goldsworthy, who received his injuries in the Consolidated Virginia shaft; and Morris Connor, who met his death in the Savage mine, while helping to lower a pump, the whole weight of the pump falling on him by the slipping of a rope. One man, named St. John, had his fingers crushed, one day this week, so badly that they had to be amputated. He was a carman, hauling ore from the railroad dump to the Rhode Island mill. This man is out of luck. By a previous accident he lost all of the fingers of his left hand, so that at present he has but two fingers with which to work.



### The California Sugar Refinery.

Prompted by curiosity to know something of how our coarse brown sugars are treated to bring them out so clear and white as they appear in the market, we went through this large refinery last week. Accompanied by the courteous son of the manager, Mr. John Spreckles, and by him furnished with sugar-proof coat and hat, we started in with an examination of the crude sugar, as purchased from the Sandwich Islands and Manila, for these are the principal kinds used, though at odd times a cargo of South American or of East Indian date sugar is purchased. Mr. Spreckles keeps a well appointed laboratory for the analysis of water (in the search for a pure article of which they have sunk several artesian wells) and of sugar. This is very necessary, as in one sample of sugar submitted much saltpetre was discovered, and the cargo rejected.

Submitting a fair article of Sandwich Island sugar to a good microscope we saw numerous turtle-shaped insects, with six legs, proboscis and tail, not over active in motion, but still enough to set one's stomach crawling even to think of eating them. We shall never, never use any more brown sugar; no sir! From the laboratory we passed into the main building, and took a look at the "blow ups," where the sugar is first dissolved by steam, and treated with lime and blood to correct acidity and clarify it. The huge vats looked like so many cauldrons of dirty, seething water, and the men skimming it did not hesitate to dip deep when they put in their ladles. The skimmings are pressed through canvas by screw power, and the juice expressed again returned to be re-clarified. The cakes of dirt obtained look and smell like ordinary clay, and are thrown out to be picked up by the poor for fuel. From here the syrup is pumped up to the fourth story into huge iron receivers, from which it passes through bag filters on its way down again. Here another lot of dirt is taken out of it, which, to all appearances, is just like the first only finer grained. The bag filters are double, being a large fine bag drawn inside of a small coarse one, and are thoroughly washed and cleansed after each use.

After leaving these last filters the syrup percolates through bone charcoal, and comes out below, changed from a burnt umber color to light straw color, and then is again pumped up into the fourth story to the vacuum pans, where it is evaporated to the crystallizing point, and then goes down again into receiving tanks that have in them large revolving dashers to keep it in constant motion to prevent the grains separating from the syrup, and also to still further assist crystallization.

From these receivers it is passed into "centrifugals," which act on the principle of smut mills in making flour. They are stationary cast iron urns, having within them rotary copper ones perforated with fine holes, through which the molasses is forced by the rapid rotary motion imparted to them, leaving the sugar within beautifully white and clear.

But this is not all. The sugar is now put in casks and passed up two stories, where it is pressed into cakes by a knuckle press invented by Mr. Spreckles, and only in use in this refinery. These cakes are then set up to dry for a time spontaneously, and then treated to a hot air bath of 130 degrees for forty-eight hours, which drives all moisture from them, and they are then passed through the crushing mill and cubing mill respectively, as required. Whatever small crumbs are made in either of these mills are put through another grinding process, and both come out powdered and fine crushed sugar.

That follows the sugar once through, but no syrup has yet been made. The syrup from the centrifugals is again hoiled and evaporated and goes through the centrifugals, and become No. 2 sugar. The residuary syrup is thus reboiled to the fifth time, and what then remains is golden syrup, which utterly refuses to crystallize.

The sugar made at the third, fourth and fifth process is mixed in varying proportions, and constitutes what is known as golden C and coffee C sugar. The second time boiled the sugar will not crystallize in less than two days. The third time it has to stand two weeks. The fourth and fifth times four weeks and more are required.

All the tanks and vats used in the establishment are of iron, and vary from a capacity of about one hundred gallons up to eight tons, which latter is the capacity of the charcoal vats, of which there are one hundred and seven. The charcoal once used for twenty-four hours is

withdrawn and subjected to a heat of eight hundred degrees for revivification, and is then ready to use again, and lasts for years. When drawn from the vats it will not stick to the lips at all, but after being purified by this intense heat it adheres quite tenaciously.

The evaporation of the sugar to produce crystallization is carried on in a vacuum, created by an immense pump, which draws the air out of the vats, which will then boil at 140 degrees, whereas 212 degrees is the boiling point in open air. When the sugar crystals begin to form in the pans more syrup is let in, which proceeds to crystallize upon the crystals already formed, not making new ones for itself. Four hours generally suffice to finish this process the first time.

The refinery is of brick, four stories, having a frontage of two hundred and forty feet on Brannan street, and is built in two sections of equal capacity. One was built in 1869-70, and the other in 1872. It can turn out one hundred and twenty tons of sugar per day, employing a force of two hundred men. The old wooden building used by them before that time on the opposite side of the street is now employed as a stable and storeroom for cooping materials. An engine of two hundred horse power furnishes all the power required, and steam is made in sixteen boilers. They have every protection possible against fire, by means of hose in all stories of the building, four hydrants, and two steam pumps, and men trained in the management of the hose.

We confess to having had a prejudice against

### Big Clean-ups.

The clean-up of the Consolidated Virginia mine for the last fiscal month was \$1,535,328.97; the fiscal month was shorter than the last, the California mill having been run but 29 days, and the Bacon and French but 28 days. The clean-up of the California mine was \$1,399,331.74. This makes a total for the bonanza for the month of \$2,934,660.73.

These figures show a production from these of nearly three million dollars for a single month. We have been so accustomed, for the past year or two, to see in print similar results from these two famous mines, that we do not appreciate them sufficiently. A few years ago we would have considered three million dollars a very large amount for a first-class mine to have produced in a year; even now it is more than most prosperous districts turn out from all the mines combined. The sum is a very large one, and if it were scattered about more in the community than it is, would be truly sufficient to cause better times. Even as it is, it does considerable good in many ways.

Three million dollars a month from two mines for many consecutive months is a better showing than can be made in any mining country in the world, and is probably more than was ever realized from any mines in the same period of time. Some of the old South American and Mexican mines yielded larger sums in the aggregate than the Comstock bonanza, but it took

### The Preparation of the Fair.

To those who only see the pavilion in its present state of completeness, no stretch of the imagination can present to the mind's eye, the utter confusion, hurry and hustle, pounding and sawing, of a few days since. The order and beauty we see around us in this vast enclosure is the result of patient labor, and vigilant watchfulness on the part of both exhibitors and officers of the fair. It is an easy matter to chalk out each man's space, and say to him "There is your allotted position;" but it is a most difficult matter to make him understand that any deviation from that chalk line discommodates others and throws the Superintendent's plan out of harmony.

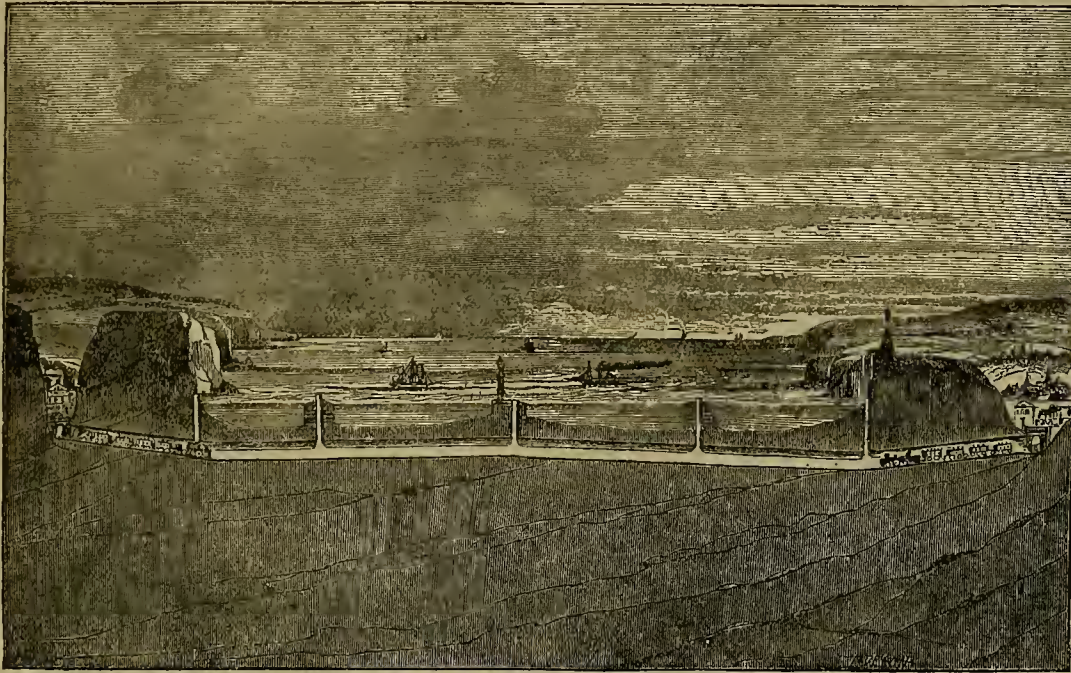
On paper the lines look perfectly satisfactory, but in the pavilion they do not always appear to the eye single to its own interests, harmonious. When he gets his counter, case, shelving or stand, as the case may be, with his goods into the position assigned him, the arrangement of his neighbor's exhibit may be such as almost entirely bide his view, and he is dissatisfied at once, and wants to move elsewhere. Or, perhaps, he would like to turn his space around, and have his parallelogram face in another direction; or his articles may be too crowded, or large for his space, and he must have a little more room. No one can imagine the amount of labor and talking that is required to reconcile these matters and preserve the organization of the whole, who has not been present for at least some hours during the influx of exhibits in the last day or two before the opening of the pavilion. Superintendent Gilmore was cornered on every turn; he was walked from one end of the building to the other constantly and repeatedly. Beckoned here and there as he passes hurriedly from one place to another, it was wonderful that he should preserve his temper and be able to respond to so many calls, and not get too confused himself to attend to any. He is the champion walker of the Pacific Coast, and ought to be Quartermaster-General of the United States.

Not less active were Secretary Culver and the other officers, and none of them had a lull left for an importunate exhibitor to lay hold of to detain them. All gone thrice over. But the battle is over, and comparative quiet reigns in the pavilion. The sound of the hammer and saw, the shout of the drayman, the snort of the restive horses, the ting-a-ling of the alarm bells responding to the efforts of the adjuiter, are done away with, and all is peace and tranquil quality within our walls. The hum of an admiring multitude takes the place of the din of constructive industry. The yell of the perspiring drayman is succeeded by the laugh of beauty and the merry chatter of the small boys, which latter are to be always found in the van of curiosity wherever we go. Weeks of quiet enjoyment will now succeed the days of busy, noisy preparation, and then will close the twelfth industrial fair of the Mechanic's Institute of San Francisco.

The managers may now sit them down in comparative peace, and congratulate themselves on their well-earned success in the conduct of the present exhibition. Announced, as it was early last winter, when everything looked favorable for one of the most prosperous years that the State ever saw, it has required their most persistent and active exertions, in the face of the entire change in the financial outlook of our State, to bring the Twelfth Industrial Exhibition up to the high standard of excellence attained by its predecessors. That they have done so is a source of pride to them and our city at large, and all honor is due them for it.

Much praise is due them from our citizens for having provided so instructive and entertaining a place of resort for our young folks and mechanics, while at the same time they have given zest to the workman's exertions in his own and employer's behalf, by reason of the encouragement he receives at the fair that his labors are appreciated. It gives an impulse to industry in every department, and to their exertions, in a great measure, is it all due.

United effort will accomplish much in any direction; but when that effort comes from such men as the board of managers, seconded by a San Francisco public it amounts to the annihilation of all obstacles and perfect success in any undertaking. Our city is noted for its thoroughness in every undertaking, whether it be of vigilance safety committees, charity or public works, industrial or other fairs, and we yield the palm to none—not even the American Institute exhibition of New York—only to the great Centennial, which had a million and a half from the public purse.



PROPOSED TUNNEL UNDER ENGLISH CHANNEL.

powdered sugar, believing from taste that flour might have been added. Now, our prejudice is transferred, in an increased ratio, to the Sandwich Island sugar. Having followed the sugar through the whole process with an eye out for adulterations, we must express confidence in the purity of the product of this refinery. Nothing that could be mixed with it was anywhere about, but sugar was everywhere; the floor, the walls, the steam pipes, the ladders, the ceiling, are all covered with sugar, but no dirt is there except what comes out of the sugar itself. It is extremely hot in all parts of the building, as it must be from the radiation from hundreds of tons of steam heated sugar, and in some parts of it the thermometer must mark 130 degrees all the time, which would be severe on men in any other than a San Francisco climate.

### The Channel Tunnel.

We have, from time to time, made note of the progress made in works preliminary to the great bore beneath the English channel, through which laden cars may be drawn from Dover cliffs to Calais town. The engraving on this page, borrowed from the *Polytechnic Review*, shows the tunnel as projected at the time the preliminary works began. More recent information seems to indicate that it will be of advantage to make the tunnel take a devious course, but this is not fixed upon as yet.

The channel tunnel is a topic of wide interest, because it will release so many from the agitation of the channel sea, and reduce the time required in the transit. It is of interest, also, because the project has been so long under consideration. At the time of the first Napoleon it was an old scheme, but one in which the "conqueror of Europe" took deep interest. Fox, the English statesman, also had the tunnel as a pet project. In our day the dream of the fathers bids fair to be realized. Our illustration will be borne in mind by the reader, as we shall record the progress of the venture as the reports come to hand in our foreign exchanges.

years and years to accomplish. Now, with improved appliances and machinery, skilled workmen and every convenience, the ore is rapidly extracted and quickly made to yield its precious contents. The precious metal is sent down for refining as fast as collected, and is then coined into gold and silver at the mint as expeditiously as possible. The whole operation is carried on with a rapidity and system unknown and impracticable until recently. The mills are the finest in the world, and all the machinery is unexcelled, so that every possible convenience for good and rapid work is at hand. Of course such results could not be attained, no matter how fine its machinery, unless the ore were first class. In the last run the California mill worked exclusively its rich ore from the 1650-foot level, averaging 330 tons per day. This ore works as well as any on the lode. The other day, from a run of 24 hours, 9,000 pounds of amalgam were taken out, which shows the richness of the ore and the rapidity with which it is worked.

Of course bonanzas of this character are scarce, and it was only with great expense and continued prospecting that this ore was found. It was blind work, too, from the nature of the undertaking, for no man could say that, sinking the shaft, the proprietors were not also sinking their money, as has too frequently happened. As soon as the bonanza was struck, however, it amply repaid all trial and expense, and has sent forth, since its discovery, a stream of gold and silver such as was never dreamed of before.

**BULLION SHIPMENTS.**—Since our last issue shipments of bullion from prominent mines have been as follows: Northern Belle, August 7th, \$7,607.46; Con. Virginia, 9th, \$250,285.33. Total for July account, \$1,535,328.97; Arizona 9th, \$834.33; Grand Prize, 10th, \$13,400; Aug. 14th, \$13,400; Tybo Con., 9th, \$4,322.04; California, 13th, \$267,957.16; first shipment August account; Con. Virginia, 13th, \$98,394.27; first shipment August account; Tybo Con., 9th, \$4,287.02; total to date, \$13,024.15; Northern Belle, Aug. 12th, \$9 358.



## Means for Promoting More Perfect Combustion of Coal.

At the tenth annual convention of the American Railway Master Mechanics' Association, one of the committees submitted an excellent report on the best material, form and proportion for locomotive boilers and fire boxes. In the course of this report they discuss the question as to whether it is beneficial to admit air to the fire box above the grate, in the use of bituminous coal in locomotive boilers. As the principles involved are applicable to all kinds of boilers and furnaces where perfect combustion is desirable, we believe the following portion of the report, which we reprint from the *Railroad Gazette*, will prove of general interest to consumers of coal:

"Your committee do not undertake to harmonize the different views expressed by those believing that the admission of air at such point is beneficial, and those who do not. The admission of air above the grate can be useful only in one particular, to furnish oxygen to unite with the gases evolved from the coals that otherwise will not receive it, and as a consequence pass through the tubes unconsumed, rendering no useful effect. An excess of air is hurtful, from the fact that it lowers the temperature in the fire box to that extent, giving back no heat in return, as only the requisite proportion of oxygen will unite in combustion with the carbonized hydrogen, and the excess of air, whatever quantity that may be, will not burn, but absorbs air and carries it off. The quantity of gas evolved from the coal in a given time is constantly varying, in the usual way of firing a locomotive. For instance, after coals have been placed in the fire box and subjected to the heat for a few seconds, the gas is evolved from it, and the air passing up through the opening between the lumps and particles it burns with a clear white flame, the combustion being then nearly or quite perfect. If air is then admitted in considerable quantities above the grate, it serves no useful purpose at that particular time, but rather the contrary. Then, in a few seconds more, several shovelfuls of fresh coals are thrown in, filling up or covering over the small air openings between the coal on the grate cooling the interior of the box to a certain extent, and at the same time the gases from the fresh coals are cooled, needing a supply of oxygen, without which they will not burn. Yet that supply of air is to a great extent cut off at that particular moment by the closing of the openings from below, as stated; and if air is not admitted above the grate in liberal quantities, combustion of the gases is not accomplished, or only in part, and the result is a cloud of smoke, until the greater portion of the gases is driven off, and air again finds its way up through the coals, to give the remainder of the gases the requisite oxygen for their perfect combustion, this operation being repeated every minute or two, or oftener, while running.

"As about one-third of the heating value of bituminous coal is the combustion of its gases, it is of very considerable importance that it be accomplished with the least possible waste; yet the difficulties to be overcome, to accomplish that end, are greater than are generally acknowledged. The difficulties are supplying the requisite supply of air to the gases, at the right time and place, needed for their perfect combustion. If air enters only through the grate and the coal on it, we find that the time that most is needed is just when it is the most difficult to get it in that way, and when the least quantity will be supplied. If through fixed openings above the grate large enough to admit the maximum quantity needed at a given time, then too much is admitted when the minimum is required. If we depend for the requisite supply upon both sources, the case is not altered in effect. Perhaps no better arrangement can be adopted in practice than a sort of compromise between admitting too much when the minimum is required, and too little when the maximum is needed. The area of such openings above the grate to accomplish that object best will vary with the kind of coal used, and can only be determined by test or experiment in each particular case."

## The Mines at Beulah.

A correspondent of the *Visalia Delta*, writing from Beulah, gives the following in regard to the mines there:

The somewhat conflicting reports of the various correspondents of this place have induced me to give you the following items based upon my own observations:

In justice to all concerned, I must say that the numerous assays made by myself of average samples of the ore now being roasted by the N. E. T. & S. Co., and the report of the working test made in San Francisco by parties whose ability and integrity are not questioned, show that the ore is rebellious. Average samples of this lot show it to consist of 70% to 75% of iron, zinc, sulphur and other substances in small quantities. The nine pounds of bullion yield at the rate of \$237.99 in silver and \$2.55 in gold per ton. The "bullion" run out last year is principally iron. Besides this it contains lime, lead, zinc, silver, gold and sulphur. To the latter it owes its brittleness.

Yesterday afternoon I visited the Loup claim. The Crabtree Bros. were working a little to the north of the company's tunnel. At a depth of about eight feet the leading ore vein

has widened to about 20 inches, is comparatively free from iron and zinc, and would probably smelt without difficulty, and is increasing in width and richness as they go down. On the McGinnis a shaft is commenced in a new place. At a depth of about 12 feet a small vein of good smelting ore has been struck. The claim owners propose to continue sinking, and will very likely find considerable good ore. The Chibuhua ore is also very good. The vein is not large, but increases in width as it goes down. A tunnel or incline on the ledge would show good ore. The indications warrant further prospecting. On the Lady Franklin a 30-foot tunnel has been run all the way in ore. About 25 tons of ore are on the dump. But it is low grade and considerable trouble will be found in working it. The tunnel is too near the surface to properly prospect the claim. An incline following the dip of the ledge would be better, and better ore would probably be found. Two shafts are working on the Mammoth. They are running a short tunnel preparatory to the sinking of a shaft. Considerable antimony and sulphurets of iron are found in the surface ore. Not much ore has yet been extracted. The indications are favorable for better ore as they go down.

By examining the various claims in the district, it appears advisable to prospect deeper than they have yet done. Judging by present indications much better ore will be found, and while this is being reduced the more rebellious surface ore can be worked in with it with much less trouble and expense than to work the surface ores alone.

The milling ore of the district consists principally of gold and silver-bearing sulphurets of iron and copper.

A small-sized rock furnace is being built about a quarter of a mile below the company's. Though there is not yet much soft ore extracted, enough can be obtained to keep this running the balance of the season.

The company's Black Wolf tunnel will prospect the ledges on the east side of this district, between Lake and Lady Franklin canyons.

## Fresno County Mines.

A correspondent of the *Fresno Examiner*, writing from the Champion quartz mine says: Knowing that you take a lively interest in all that pertains in any manner to the prosperity of Fresno county, and that a few items in relation to the quartz mines of this vicinity may prove interesting to your numerous readers, I will endeavor to give you a brief description of the Champion lode, about one mile east of Big Dry creek, where that stream passes out of a gorge in the foothills into the valley. The Champion lode is situated in a vast dyke of slate, which is about one mile in width at this point; the course of the ledge is N. W., S. E., and outcrops occasionally for about a mile. That this lode of quartz is a valuable gold-bearing vein, has been demonstrated by actual milling tests. The vein of quartz varies in width from two to twelve feet in thickness, all carrying gold an average of ten dollars per ton. There are four claims on the ledge that have been prospected to a depth of forty to fifty feet by shafts; on two of the claims only has there been any drifting done. The "Original Champion" location was made in May, 1866, by R. M. Keys and the Atwell Brothers. These parties performed considerable work on their claim, and in the following month of December sold out to Messrs. Belloys, Badger & Co., of Lugo county. These gentlemen did considerable work, amongst other things, sinking a shaft some thirty odd feet, and taking out considerable quantity of good ore. I am informed that some of the ore taken out of this shaft was very rich, being valued at one dollar per pound. Other business requiring their attention, they have done nothing more than the necessary work to hold their claim, for several years past.

The next claim to the south-east is the property of Messrs. Jensen & Keyes, and consists of 800 linear feet. The developments on this claim consist of one shaft down thirty feet, also another shaft down fifty feet, and a drift at the bottom of twenty-five feet; also a short drift on the twenty-five foot level. The next claim to the south-east, owned by Capt. W. J. Smith & Co., is 1,500 linear feet in extent. This claim has been more extensively opened than any other on the lode. An open cut and a drift of about one hundred feet has been run into the side-hill; a shaft sunk at the commencement of the cut to a depth of forty feet to the south-east; inside the drift, a winze was sunk a depth of thirty-five feet, and the outside shaft and winze connected at the bottom by a drift, showing the vein at that depth varying in thickness from two to five feet, and being encased between well-defined slate walls, with a heavy gouge next the hanging wall. One lot of thirteen tons of ore, taken from this mine, milled \$24.50 per ton. There have been 100 tons of ore worked in the mill from this mine, and the average gross yield of bullion was \$15 per ton. This is the farthest claim to the southeast on the lode. Adjoining the "Original Champion" on the northwest is the "Gray Eagle" claim of 1,500 linear feet, which was opened by a shaft to the depth of forty feet, in the summer of 1875, and one lot of ore from this shaft worked in an assay yielded \$12.40 per ton; also 10 tons worked in mill yielded \$10 per ton. No work has been done on this claim since the summer of 1875; it was recently re-located by J. O. Litten, who shortly intends to commence work to thoroughly develop it.

The convenience and facilities for developing these mines are all that could be desired. Wood and water in abundance, ease of access from railroad and good roads to all of the mines already built. Lumber and mining timbers can be laid down at the mines for \$16 per thousand feet, and round pine, mining timbers at about half that price. The altitude of the mines is 1,470 feet above sea level, and they are so situated that they can be drained to a depth of 500 or 600 feet at comparatively small expense. That these mines have true merit is fully demonstrated; it is an immense property and requires a comparatively small outlay of capital to put them into a self-sustaining and dividend-paying condition; the ledge has been prospected to a depth of 50 feet for a distance of nearly a mile, and averages a thickness of two to twelve feet, and ore has been milled from all portions of the ledge, the general average being \$10 per ton. It has all the characteristics of a true fissure vein, and the ore is all rich in sulphurets, bearing gold and silver, which if properly saved and worked, I am satisfied would pay all reasonable expense of mining and milling the ore, and would leave the free gold the ore carries as a clear profit. Taking into consideration the immense ore body, the facilities for cheap supplies and transportation, abundance of wood, water and cheap lumber, and its convenience to railroad, it makes it one of the most desirable mining properties in the State, and only requires to be in the hands of energetic mining men, with means to properly develop it, to rank it among the best paying mines in the State.

The property is principally in the hands of poor men who have not the means to develop their claims, but who are willing to give mining men with capital a liberal show to furnish the means of prospecting and opening up their claims; or they will sell out at reasonable prices. No fancy prices are asked, and parties in search of desirable quartz mines would do well to come and see these mines, as they will hear inspection. There are other mining claims in this vicinity.

## Tuscarora.

A Virginian, who has just returned from Tuscarora mining district, gives the *Enterprise* a few items in regard to what is being done and what is to be seen thitherward.

### The Town of Tuscarora

Contains from 700 to 800 inhabitants. It is a very lively little camp, reminding one of new mining camps in the early days of California. Particularly is this the case on Sundays, when men charge up and down the streets on hacking mustangs, riding through lumber piles and mortar beds, and into saloons. Our Virginian saw one fellow attempt to ride into a saloon, when his head struck a post and he was tumbled backward into the street, where he was at once gobbled up by the sheriff.

### Mines and Mills.

Both the Grand Prize mills are running—one (the old) is of 10 and the other of 20 stamps. The De Fries company have their hoisting works in operation and are building a 20-stamp mill. The Hornet company are putting up hoisting works and have their engine on the ground. William Clark, broker of this city, with others, has bought the Navajo mine, and extension of the Hornet. The price mentioned on the ground is \$17,000. Several companies are engaged in putting up small hoisting works, in which will be placed donkey engines.

### Buildings, Prices, Etc.

A good deal of building is going on in Tuscarora. One two-story brick building has been completed. It is 28x60. The first floor will be occupied as a saloon and the second as a club room. A large frame building is also being erected for use as a club room.

Common lumber sells at \$60 and sugar pine at \$100 per thousand; redwood shingles sell at \$8 per thousand.

The distance from Elko to Tuscarora is 50 miles, which is made in nine hours. Fare between the two points, \$7.50. Meals at Tuscarora, 50 cents.

### Stewart's Ranch.

Prof. W. Frank Stewart has (in partnership with Governor Bradley) taken up a ranch near the town of Tuscarora. He has built a house on the ranch and considers himself fixed. He has got the geology of the country by heart, and is ready to give all comers full information in regard to the mines of all that region.

The country is full of ledges. These have been located, and the owners have sunk small prospect shafts on them, and are holding them to sell.

### Game and Fish.

It is about 46 miles from Elko to the Owyhee river, a stream in which both brook and salmon trout abound. About the Owyhee are also to be found immense numbers of sage hens. The young ones are now of just the right size for the table. They come quite close to the road.

THE heading of the Burleigh tunnel, now 2,200 feet into Sherman mountain, is progressing at the rate of two feet per day. The air-compressors have been overhauled and are doing better work than before. The shaft sunk from the tunnel level on the Big lode (supposed to be the Mendota) is still in good ore and 45 feet deep. A level will soon be run west, which will probably open a valuable block of ground, as this forms the continuation of the ore course above, which produced \$45,000.—*Georgetown Courier*.

## Progressive Mechanism and Fairs.

The height of human glory is elevation by accomplishing the greatest amount of work with the least of physical labor, that the brain may become the operative power instead of the hand. In former years the hardy reaper wiped the sweat from his fevered brow, and ever wet his scythe with a wish that relief from such arduous labor would come to him. The progressive mechanic heard the wish, and to-day the modern reaper moves over the field "as a thing of life," performing the duty of more than two score of hands. Steam power has performed its miracles, until its combined benefits is equivalent to the support of seventy-five millions of people daily.

Thought too, by the artisan's instruments, is made to travel with lightning speed annihilating time and space, and allowing the accomplishment, often of vast labor in a moiety of toil and time—thus allowing the active worker to accomplish more in a single generation than could possibly have been done in a century prior to 1800. Thus without comment further, we may say progressive mechanism, walking hand and hand with the arts and sciences, becomes the grand promoter of human happiness, and it thus behooves every mechanical mind to look about him and think—think for the accomplishment of something in advance of the present. Plodders in the old furrows of time have an easier world to live in, but it is the thinking, active progressiveness, of the mechanical mind which covers the age with glory. One of the greatest promoters of mechanical advancement, is the congregation of all kinds of devices at fairs.

All fairs are the workshops of thought. Men and women should patronize them with all their mechanical devices, crude or perfected; then visit—look—compare—think and improve. It must be remembered that in progressive mechanism, California holds no inferior position; in fact, rates higher, per population, than any State in the Union. Such being the case, our mountain towns are stored with men of ideas, and new machines of many kinds; all should be aggregated at these opportune times, such as our Mechanics' fairs afford. It is said, and truthfully, too, that every thought has some reality at the back of it, and that we sometimes think wiser than we know. So new things, though simple, often grow to things of merit—an idea often grows into a machine of power. How unlike ages past is the present; valuable discoveries then were held as treasured secrets, to be shown or divulged under the penalty of death. The secret of the manufacture of "Dresden porcelain" was held for 200 years. The manufacture of tin for over half a century. The first manufacturers of steel held the secret for a long period, and so with many other grand discoveries, but how is it now? He who makes one step in advance, finds protection in our laws, and profit in the largest display, and this is why we progress faster; ideas build on ideas, and we advance from them. Mechanics' fairs should thus be regarded as of untold value to the State, and should be as they ever have been, liberally patronized, and, it is to be hoped, that the coming one will be the crowning one.—*Almarin B. Paul in Fair Daily, July 31, 1877.*

MEADOW LAKE AGAIN.—One of the most promising, and yet, perhaps, of all the most delusive, of California mining excitements was that of Meadow Lake, Nevada county, or "Excelsior," as it is generally termed. The gold was there and the ledges were large and almost innumerable; also many of them afforded promising prospects by assay or the ordinary hand-mortal process, but expensive mills, with all the latest improved appliances, failed to realize their promises. The precious and base metals were so closely intermingled as to baffle the most skillful manipulators. Much inventive talent has since been displayed, and even dreams been invoked in devising new furnaces and processes for the successful working of these ores, but thus far to very little purpose. Now, however, comes another ray of hope. A Nevada county exchange says: A gentleman by the name of Mr. Crail, one of the first locators in this district, but who left shortly after, when it was discovered that none of the ledges could be made to pay unless some new process could be discovered for their successful working, after an absence of several years, returned recently from Washington Territory, and is now located at Meadow Lake. He has with him a patent on smelting works, himself the inventor, and claims through this process the ledges of Meadow Lake can be made to pay good dividends. Frank Pauson, of Truckee, one of the heavy mine owners in this district, has furnished Mr. Crail with the necessary means to construct and put his smelting works in working order. We hope Mr. Crail's process will do all that is claimed for it, and, if it does, Meadow Lake will be a second Virginia City.—*Record-Union*.

THERE are 200 stamps in operation in the Deadwood mines. The ore runs on an average \$30 per ton. Three men can take out enough ore to run a common 15-stamp mill 24 hours. The scale of prices established for crushing ore by the different mills is \$80 per cord—eight tons of ore.—*Georgetown Courier*.

SOUNDING BRASS.—The composition of Chinese gongs has been found by the analysis of many specimens to be as follows: Copper, 82.00 parts; tin, 17.00; iron, 1.00; nickel, traces. The last-named metal can only be discovered by operating upon several grammes of the alloy.



## All the World for American Mechanics.

I saw by the papers some weeks ago that you were going to give us another FAIR DAILY this year, and for one, or more, I am glad of it. I say for one or more, for I found last year that my wife used to take pleasure in reading the FAIR DAILY after we had come home from the Fair.

This was not what I set out to write, but the thought is proper enough perhaps. I began to say that I had a chance to read a paper from the old country the other day, and would you believe it, there was a whole column of writing to show that Americans were beating English mechanics all to pieces in selling their machines and tools to outside countries, which have formerly bought all their iron manufactures of England. It was a queer thought to me, for when I last breathed the smoke of Sheffield, there was no more thought that anything decent could be made out of iron in America than in Greenland. I cannot remember all that the English paper said about the things which were now pushing their own out of the foreign markets, but it was, just as I say, a full column of tacks and tracks and hacks and packs and picks, made in this country and going across the water to bump the noses of English manufacturers. I remember there were thousands of plows and reapers going all over, from Scotland to Capetown, and from Brazil to India. Then there was a whole cargo of locomotive engines and cars going to start a railway in Brazil. This is nothing compared with the full list but it will show what I mean. It is, that now American mechanics have gained a point which they hardly had reason to hope for so soon, and now it behooves them to go ahead and keep up the success which they have gained.

That is what I want to talk about briefly, and I have been longer getting to my subject than I shall be in getting through with it. We mechanics have got to push ourselves forward if we hold what we have already gained and get more. This hammering away with muscle, and leaving all the brain work to be done in the office or the master mechanic's room, will not advance us a peg. If we only wake up and put ourselves in possession of every ray of light which falls across our pathway, we shall soon see that we are masters of the occasion, and not slaves to it. Now I believe in mastery which comes from real merit and practical success. I don't ask that I shall be put up or down by dishonorable means, but that, by so using the force of union as to advance our understanding of the matters which affect us, we shall be able to act intelligently and work effectively for our own good. And if we awake to this possibility in us, we shall also perceive new chances in the work in which we are engaged by day. All machines are as yet imperfect. I have often noticed, in reading pieces about engineers' reports on different machines, etc., how much power is lost in the mere turning of the machine—power which never comes to do effective work. Every improvement which is introduced to save some of this lost power will be so much gain to the world and to the mechanic who shows the way to save it. Then we need better adaptation, in many machines, to the work to be done by them.

It is because American mechanics have made much progress in these and other directions of mechanical improvement, that our manufacturers find they can drive the English manufactured goods out of many markets. It is because we have succeeded in putting more brains into our machines. It is because some of our mechanics have kept their eyes open as they worked, and after they left the benches and the lathes. It is because they kept their heads at work with something more profitable than ward politics. It is because they succeeded in showing new signs of the victory of mind over material.

I would say to my fellow-workers who can get an evening once in a while to spend at the Fair, or who, better still, can get a season ticket and come nearly every evening, let us make this Fair of some practical value to us. Do not let us walk around without a thought of what is near us. I have always found it of great good to me to take a friend of mine, who is working in the same kind of work as I am, and then we can talk over things together. When we come to something that is shown as an improvement in our line we can discuss it, and our two minds are always better than one in getting at the good and bad points about a new thing. Ho and I have several times seen things which suggested still better improvements, and you may hear from us through the Patent Office hereafter long.

As I said before it devolves upon us young and active mechanics to sustain the advance which our fathers and friends have already gained in pushing the name of "American mechanic" into honor. Let us go to work for still greater progress, so that we may be true to the general advancement of the world. We don't have time to compare views and to see what other hands can do when we are at our hoes and forges. Let us make the Mechanics' Fair the grand place for profitable intercourse. Let us make it a sort of mechanics' school, for the study of all mechanical principles and embodiments which may be shown. Knowing that the FAIR DAILY will help us to an understanding of all the things on exhibition this year we hope you every success with your publication. —Cold Chisel in Mechanics' Fair Daily.

## Getting Money.

The most unfortunate day in the career of any young man, is the day on which he fancies there is some better way to get money than to earn it; for from that feeling spring the many extravagant and visionary schemes which are indulged in for the purpose of gaining a livelihood without labor. When a young man once becomes thoroughly infected with this feeling he is ready to adopt any means for the accomplishment of his object; and if his plans are frustrated, and he is foiled in his efforts, upon the very crest of the wave which he has already mounted, and in full view, is the temptation to crime, to shield him from disgrace, which he thinks must inevitably follow in the wake of the defeat; to this he yields. And the first he realizes he finds himself the violator of the law, a criminal in the eyes of the community, and an inmate of a prison, awaiting trial—all brought on for the want of a little manly firmness in the outset of life to prompt him to choose an avocation in life where the penny earned would bring with it a sure reward. Then let our young men spurn the idea of obtaining money without rendering an equivalent; let them be ready and willing to occupy positions in life which will give them the best possible opportunity to develop their natural talent, and do good to others while helping themselves; in this way we shall have a nation of noble men and women, which will be a source of profit and pleasure to us and a subject of wonder and admiration to the world. —Boston Investigator.

UNSUCCESSFUL PROSPECT IN THE ELK MOUNTAINS.—The Salt Lake Tribune says: About six weeks ago a party of some 25 young men—Saints chiefly—got the gold fever and started for the Elk mountains. The most of them went from this city, and the others from Nephi. They have now returned, having been unsuccessful in their search for the precious yellow metal. It was no trouble at all to find color, but everywhere the gold was so fine that it was impossible to save it, and finally the enterprise was abandoned as useless. The weather in the southeastern portion of the Territory is exceedingly hot, especially in the valleys, where many of the party fell sick and were obliged to seek a cooler atmosphere in the high mountains. This party took the old Gunnison trail, and in their march came upon the deserted Indian camp where the Green brothers were killed last winter and had their stock driven off. The body of the younger brother was found within a few yards of the camp, in a dried up, mummified condition, with the clothing still on, and a bullet hole through the back of the head. The remains were buried by the prospectors where they were found, and a rude and simple monument erected over the spot. About 40 head of the cattle were discovered, gathered together, and are being driven to the settlements of one of the lower counties by a detachment of the gold seekers.

THE CHANNEL TUNNEL.—At a recent meeting of the French Society of Civil Engineers, the proposed submarine tunnel between England and France was discussed. It appears that, owing to the geological formation of the bed of the channel and other reasons, it may be expedient to trace the tunnel, not in a straight line, but in a curved direction. M. Larousse, a hydrographical engineer, who had been invited to attend the sitting, gave the results of some calculations which he had made to determine the amount of deviation which would be likely to take place in driving galleries starting from opposite shores so that their axis should exactly meet midway between the two shafts from which they depart. Allowing the maximum error which is at all likely to be made, either in measuring distances or in reading off angles, M. Larousse calculates that in the case of a straight tunnel the total deviation of the axis would not exceed 1.28 meters from the right line joining the two starting points. With an indirect trace, formed by straight lines starting from either end, and joined in the center by an arc of 2,500 meters in length, having a radius of 2,700 meters, the maximum deviation of the axis of the two galleries would not exceed 4.4 meters. With an indirect trace formed of five curves the maximum deviation would not be more than 8.35 meters, and therefore very slightly in excess of the width of the tunnel, which it is proposed should be eight meters.

OLD TIME IRON WORKS.—On the outlet of Sterling lakes, in the southwestern part of Orange county, New York, is still in active operation the iron works founded by Lord Sterling, 25 years before the revolution. The first anchors ever made in America, it is believed, were forged at these ancient works in 1752. The great chain which was stretched across the Hudson river to obstruct the passage of the British fleet was made at Sterling works in 1777. The chain weighed 186 tons, and was six weeks in making. It was transported in links to West Point in carts drawn by oxen. Each link weighed 150 pounds.

BODIE.—Bodie district, Mono county, Cal., and five miles from the Nevada line, is reported, by those recently there, as improving rapidly. Miners are flocking there and to Aurora and other towns in Esmeralda county, in this State, in great numbers. The mines around Bodie and Aurora are beginning to pay, several mills being in operation besides that of the Standard company. The ore is gold, and averages \$50 per ton.

MODERN SPRING MAKING.—Formerly, says the Hub, springs were made entirely by hand, but to-day machinery does all the work, except the final setting and tempering. The ears are dropped out and prepared by machinery, the steel is prepared for the ears by another machine, while still another places them in position and secures them, when they are again beated and placed in a welding machine, called a header. The steel for the outer plates is cut off by one machine and drawn out by another, and the plates known as filler—the under main plates—are also drawn down by one machine and turned by another. The spring is then taken to the setter and temperer. The plate is heated the whole length and formed to fit the preceding one by a hand-pinning process, and while still red-hot it is put in the bath or tempering vat, which is a metal tub filled with oil and resting in a wooden tank, in which there is a continuous stream of fresh water running. After tempering, the springs are refitted, put together and placed under a steam-tester, when, if perfect, they are ground, buffed and finished. The time required to make a pair of four-plate huggy springs is, at present, about three hours, or perhaps one-fourth the time required by the old-fashioned method, and, at the same time, a superior article is produced.

GOLD IN ARTIFICIAL GEMS.—Gold and its salts are employed in the preparation of artificial gems. In the artificial topaz, one grain of gold in 1,000 with 30 or 40 grains of antimony-glass has been detected. In the best specimens of the fictitious ruby we have a similar mixture, but the yellow is changed to red by remelting in the oxidizing flame of the blow-pipe. In the artificial amethyst and the Syrian garnet, there is either the purple of cassius with oxide of cobalt or fulminating gold with antimony. The perfection of some of these fictitious gems is such as to deceive many. The great crucial test for gems, their hardness, can, however, soon decide between the genuine stone and the most perfect imitation, which, after all, is nothing but colored glass.

THE SIMPLON TUNNEL.—The preliminary surveys for the cutting of the Simplon tunnel and the construction of the approaches are in course of execution. The plans were finished in the Bureau of Lausanne. The line commencing at Brigue, and which will serve as an international station at the entrance of the tunnel, has a length of 18,340 meters. The tunnel emerges at Isella, and the line advances from there to Bomo d'Assolla. The total length of the line is estimated at 46,900 meters. Near Bomo it joins the old ways, which continue the Italian lines to the station of Arona. As far as the village of Crevola the line runs along the left bank of the Boveria, but arriving at this point it crosses the river on a large viaduct.

STEAM ON CANALS.—An appropriation of \$5,000 has been made by the New York legislature to enable Mr. H. H. Baker to lay an experimental portion of his single rail propelling track along the bank of the Erie canal. The rail, which is to be elevated, is intended to act in connection with cogwheels and an inexpensive engine on each canal boat, as a substitute for horses. The machinery is simple, and a model which has been exhibited has worked well.



For circulars, address

Rev. DAVID McCLEURE, Principal,  
OAKLAND, CAL.

## NOTICE.

To JOHN HOWELL, FRANCIS SMITH and D. B. STARRATT—Gentlemen:—You are hereby notified that I have this day revoked the license given to you on the 22d day of August, 1871, authorizing you to erect the White Rotary Furnace, in Lander County, Nevada, because of non-compliance with the conditions of said license and agreement, and all your rights and privileges under said license are hereby terminated. GEO. W. WHITE.

TO THE PUBLIC.—After this date no person has authority to construct or grant to others the right to construct or use a White Rotary Furnace but myself. Neither has any party a right to make or sell any furnace with so-called improvements added thereto. GEO. W. WHITE.  
August 10th, 1877.

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San Francisco.



Continued from page 101:

clean-up averaged \$25 per ton. J. B. Pearson, Superintendent of the Pearson mill, at Central City, has made a contract with the Keet's mine to run the full 20-stamps on ore from that mine for the next 90 days. The Keet's mine has now 1,000 tons of ore on the dump, and is adding to it at the rate of 80 tons per day, with a night shift of 12 men. The dump was being enlarged yesterday to a capacity of 5,000 tons. The latest clean-up from the Keet's mine was made at Pearson's mill on Sunday from 173 tons of rock. The result was 230 ounces and 163 pennyweights, worth fully \$20 per ounce. The return is the best yet obtained from any mine, and this particular batch of ore is worked very close up to the assays.

## Idaho.

**POORMAN.**—Owyhee *Avalanche*, Aug. 11: Late reports from San Francisco state that a strong effort is being made to resume work in the Poorman, and that the outlook is quite promising. The resumption of work in the Poorman, under competent and satisfactory auspices, would be the dawn of a new era in the history of mining operations in this camp. All the recent developments in mines in the immediate vicinity of the Poorman go to prove the existence of a magnificent central bonanza below the 7th level in this mine, and it is the united belief of old and experienced miners here, based upon indications peculiar to the formation of the country, that the ledge to be tapped in the lower levels will surpass in richness anything of the kind encountered in the upper levels of the Poorman in its most palmy days.

The Poorman wears a more promising look than ever. Several hundred tons of rock can be taken out now without the performance of any dead work, and it seems certain that this mine is just entering upon a grand career of prosperity. Some 52 tons of rock were recently crushed and yielded about \$35.50 to the ton, an unsatisfactory result, and one that will probably be nearly doubled at the next crushing.

SINKING operations in the Golden Chariot are progressing favorably. An additional depth of 46 feet was accomplished in the past four weeks. At this rate the work of sinking 200 feet will be accomplished much sooner than was predicted.

ANOTHER effort will be made in a few days looking to the starting up of the Oro Fino. The property is entirely too good to remain idle.

**SUPR. TOWNSEND** reports everything looking favorable at the Empire. Teams are hauling to the Leonard mill, and another crushing will be made next week.

## Oregon.

**DITCH COMPLETED.**—Oregon *Sentinel*, Aug. 8: V. Smith came in from Elliot Creek mines on Monday and reports his ditch as nearly completed. They had about a quarter of a mile to dig, and when finished, will have an abundance of water to work, all the year round. These mines have shown a splendid prospect, and since they have the water necessary to work them with, the owners think they have struck a bonanza.

## Utah.

**SANDY.**—Cor. Salt Lake *Tribune*, Aug. 14: The long-looked-for improved sampling mill to be located here is fast approaching completion. Already the stacks and hoppers are rising.

**ALTA.**—The mines are now dry and in splendid condition, and are being worked by full forces. The machinery for the Toledo mine will soon be in running order. Several new strikes have occurred; the latest and best is the Nahov, owned by Boatman, Varney, Brough and others, from which large quantities of good ore are being shipped. There is a movement here to organize a miner's union for the purpose of increasing miner's wages.

## General News Items.

**CHOLERA** has appeared in several ports along the coast of China.

THERE is more trouble on the Texas border, caused by raiding Mexicans.

ABOUT 500 Chinamen have taken passage on the *City of New York* for Honolulu.

THE crusade against the press in France daily becomes more active and oppressive.

ACHMET PASHA, who surrendered Nikopolis to the Russians, has committed suicide.

GREAT destitution is said to prevail among the white and colored workmen of the District of Columbia.

CARS for the California street cable road are being built in this city as well as at Sacramento. The contract has been given to the Kimball Company.

FEARFUL floods are reported from Buenos Ayres, destroying millions of sheep and cattle, and rendering hundreds of families homeless.

THE Scotch shipwrights on the Clyde have agreed to refer their dispute with the masters to arbitration, and a speedy end of the great strike is anticipated.

THE employees of the Treasury Department at Washington have been informed that a failure to pay their just debts will subject them to dismissal.

TWELVE conductors of the Second avenue horse-car line, in New York, have been arrested and warrants issued for about 50 others, on a charge of "beating" the bell-punch and pocketing the proceeds of the cheat.

THE steamship *Frigorifique*, built for preserving fresh meat on long voyages, has arrived at Rouen from the river Plata with a cargo of meat in fine condition. One hundred and twelve days elapsed since she began loading.

A TERRIBLE battle was fought by General Gibbon's command and the Nez Perces on the ninth instant, resulting disastrously to the troops, who were driven back by the savages. Out of 100 in the command, 80 were killed or wounded.

OF 3,447 certificates of citizenship issued by County Clerk Reynolds in this city last year, 1,502 were given to natives of Ireland, 343 to natives of Germany, and 306 to natives of Prussia. During the year 1,407 declarations of intention were made.

MR. JAMES STEVENSON, of the Geological Survey, who accompanied the scientific party on the way out from the East, called on us this week. He returned East on Friday.

WOODWARD'S GARDENS has the following new attractions: The buffalo chase; large whale skeleton; new museum; improvements in the zoological department, besides the other features which have made it popular.

## PATENTS AND INVENTIONS.

## A Weekly List of U. S. Patents Issued to Pacific Coast Inventors.

(FROM OFFICIAL REPORTS FOR THE MINING AND SCIENTIFIC PRESS, DEWEY & CO., PUBLISHERS AND U. S. AND FOREIGN PATENT AGENTS.)

By Special Dispatch, Dated Washington, D. C., July 24th, 1877.

FOR WEEK ENDING JULY 31ST, 1877.

- 193,685. CLACK VALVES FOR PUMPS.—William C. D. Body, Virginia City, Nev.  
193,687. SECTIONAL CHIMNEYS.—Jeremiah Brownell, S. F.  
193,722. FILTERS AND COOLERS.—Jordan Peter, of Petaluma, and Thomas C. Walter, S. F.  
193,757. TRAMWAY TRACKS FOR WIRE-ROPE RAILROADS.—William Eppelsheimer, S. F.  
193,761. LIQUID MEASURES.—Lucien B. Healy, S. F.  
193,773. SAFETY HOOK.—William E. Murray, Ukiah, Cal.  
193,787. DUST TRAPS FOR FURNACES.—Thomas J. Taylor, Eureka, Nev.

## LARELS.

LABEL FOR MOODY'S CONCENTRATED FLUID EXTRACT OF SASSAPARILLA, STILLINGIA AND YELLOW DOCK.—John C. Moody, S. F.

—The patents are not ready for delivery by the Patent Office until some 14 days after the date of issue.

NOTE.—Copies of U. S. and Foreign Patents furnished by Dewey & Co., in the shortest time possible (by telegraph or otherwise) at the lowest rates. All patent business for Pacific coast inventors transacted with perfect security and in the shortest possible time.

## Notices of Recent Patents.

Among the patents recently obtained through Dewey & Co.'s SCIENTIFIC PRESS American and Foreign Patent Agency, the following are worthy of mention:

**CLACK OR VALVE FOR PUMPS.**—Wm. C. D. Body, Virginia City, Nev. This invention relates to certain improvements in the construction of pump-valves, or clacks, as they are commonly known, and it consists in a novel method of forming a face of wood upon a metal valve, so as to make a tight joint of material which can easily be replaced whenever desired. The valves of large mining and other pumps are usually made of iron, and have a leather face properly secured to form the joint when the valve is closed. This leather face forms a tolerably good joint when used in cold water, and is only open to the objection of rapid wear; but in deep mines hot water is encountered, and the wear of the leather is then so rapid that a set of valves will only last a short time, sometimes only a few hours, causing great delay and expense to replace them. This inventor employs a series of rubber, wooden or other blocks, which are sawed off to a certain size, and have one end cut so as to diverge or form a dovetail. The valve or clack is made of iron, with a hinge at one side in the usual manner. In the face of this valve is turned a groove, which is made broader at the bottom than at the top, so as to receive the dovetail-shaped blocks. A slot is cut in the face of the valve, connecting with the circular groove at one point, and through this slot are introduced the blocks, they being moved around in the groove until the whole space is filled. The last block fills the space opposite the slot, and a block just fits this slot and is held in place by a screw, thus firmly keying all the blocks in place and preventing them from coming out. The blocks are preferably made of hard wood, with the end of the grain outward, and projecting somewhat—say three-fourths of an inch—from the surface. This gives a face that will last for months and make a perfectly tight joint, at much less expense than the leather.

**IMPROVEMENTS IN SECTIONAL CHIMNEYS.**—J. Brownell, S. F. The improvement relates to such chimneys as are composed of tubular sections, either single or double, placed upon one another, and secured in place so as to form a continuous flue. In putting together a chimney of this kind it is necessary to protect and cover the joints permanently, and to stay the meeting ends of the sections, so that they will not be displaced by shocks or jars. This is especially necessary in a country which is subject to earthquakes, and where the building in which the chimney is constructed is liable to settle, as the slightest disturbance of a long chimney thus constructed is liable to displace the sections and open the joints, so that the flue becomes dangerous, on account of the liability of sparks escaping through the cracks or open joints, and setting fire to the house. Mr. Brownell's latest invention provides what he calls a combined joint band and diaphragm, which is so constructed that it embraces the joints closely and stays the ends of the sections in place by serving as a brace to keep the joints in their proper relative positions.

**FILTER AND COOLER.**—Jordan Peter, Petaluma, and T. C. Walter, S. F. This is a novel arrangement of a water cooler and filter for supplying pure cool water to houses for drinking and other purposes. The chief feature of the invention is a subterranean cooling vessel, which provides a cheap, simple and effective device for preserving a uniform temperature in combination with the above-ground filter.

THE decision in the Eureka Consolidated suit against the Richmond will be given on Monday, August 20th.

## Fairbank's Scales.

An important advantage to be gained by the exhibition of manufactures in the fair is the making known to our people the results of ingenuity that is practical. The plan embodies the idea that those men are the successful competitors for public favor by whose invention and enterprise the world receives the most positive benefit. For this purpose of the exhibition he who teaches us to save time and labor, and to practice true economy in regard to what we use and what we do, is the man to gain laurels. In this connection we cannot forbear speaking at some length of Messrs. E. and T. Fairbanks & Co., manufacturers of the celebrated Fairbank's scales, St. Johnsbury, Vermont. For a long series of years the Fairbanks Company has sought out new inventions and applied its unequalled facilities to the making and furnishing the most accurate weighing apparatus, in the most numerous variety of pattern and style. It makes scales that will justly weigh anything and everything, suitable for and adapted to the systems of all countries.

It is a literal fact that the Philadelphia Exposition was weighed upon their scales, buildings and merchandise, a Fairbank's track scale having been placed on the grounds by the contractor, and all the material for all the buildings was weighed upon it. Goods that were received for exhibit and articles taken or given out by terminal agencies were weighed on Fairbank's scales.

The value of a scale consists in its being correct in the beginning, and, in despite of use, remaining so. The records of stores show that one of these scales had been in constant use for thirty years, without repairs, and yet turns quickly, and stands the test of the official scaler. The records of the manufacturers show that this scale was made in 1833, and has been in use thirty-three years, and without repairs. The present shop number of that class of scale is over 278,000.

We name another instance of accuracy and service, that of a Fairbank's railroad track scale that has been in use by the Lehigh Valley Railroad, and which has weighed 24,000,000 tons of material—often 60,000 tons per day—and has never required repair in any particular. These track scales are from fifteen to one hundred and twenty-five feet or more in length, and a loaded train may slowly pass over one of them, and each car, without uncoupling, be weighed without loss of time.

The company have a process for the making of steel that is as keen as a razor blade upon its edge, and tough as Norway iron. The use of this insures the utmost delicacy of action in the balance and power of resistance to heavy weights. The greatest care is given to the finish of all the working parts of its scales; they are sensitive and durable throughout; they strain upon them, when weighing, is distributed over the levers properly placed in most exact position to insure this result; everything used in their make is of the best quality, and the American system that details interchangeability of parts is adopted in its great factory, all parts of its numerous varieties of scales being made to standard gauges, so that any part of any scale being lost or broken may be at once replaced.

That the Messrs. Fairbanks have studied the interests of the place in which their very extensive works are located is proved by the handsome Athenaeum building, containing a choice library of about 8,000 volumes, a reading room with the leading papers and periodicals, and a handsome lecture hall; by the substantial schoolhouses and other public buildings, and by other evidences of thrift and taste, and means for culture such as few towns of 5,000 inhabitants can boast. The reading room and library are free to all.

A few statistics concerning this immense business may be of interest.

The company gives employment to nearly 900 men. The shops, built of brick cover a flooring of 6½ acres. They have 93 tenement houses, run their own saw-mill, and own 6,000 acres of timber lands. They consume 4,000 tons of coal annually, using 5,000 tons of iron, 2,000,000 feet of lumber, and large quantities of copper, tin, nails, screws, etc. Their annual freightage is 20,000 tons, and the factory product is 50,000 scales yearly.

They hold 28 patents upon scales and scale machinery, many of them of recent date, and new patents on recent improvements are being applied for, while their position as the largest scale manufacturers in the world has been gained and is held, not by force of their patents, but by strict adherence to their principle to allow only perfect goods to bear their name. The company has a world-wide reputation to maintain, and it is entirely safe to assert that all improvements in designs for needed purposes have been or will be adopted as soon as found to be of real worth.

In the exchange of nearly all commodities weighing is of primary importance, and only the most perfect and accurate weighing apparatus can safely be used. Herein, with especial regard, the motto, "Quality is the test of cheapness," has been acknowledged by the whole weighing world.

It is of the greatest consequence to the com-

munity that such a house leads in the manufacture of articles so essential to every-day life. It exerts a moral influence for good. The manufacturer is proud of the product that he can guarantee in every regard, and the purchaser is satisfied in the possession of a property the intrinsic truth and value of which no one disputes. —*Mechanics' Fair Daily.*

## METALS.

WHOLESALE.

THURSDAY, M., August 16, 1877.

IRON.			
American Pig, ton.	28 00	@ 32 00	
Scotch Pig, ton.	28 00	@ 33 00	
White Pig, ton.	28 00	@ 34 00	
Oregon Pig, ton.	28 00	@ 35 00	
Refined Bar.	34 00	@ 65	
Horse Shoes, keg.	5 00	@ 71	
Nail Rod.	24 00	@ 71	
Norway, Or.	24 00	@ 71	
Rolled.	24 00	@ 71	
COPPER.			
Copper, refined.	37 00	@ 40	
Sheeting, B.	37 00	@ 40	
Sheeting, Yellow.	21 00	@ 22	
Sheeting, Old Yellow.	10 00	@ 11	
Composition Nails.	21 00	@ 21	
Composition Bolts.	24 00	@ 24	
STEEL.			
English Cast, lb.	14 00	@ 25	
Anderson & Woods, ordinary sizes.	16 00	@ 25	
Drill.	16 00	@ 25	
Flat Bar.	16 00	@ 25	
Flow Steel.	18 00	@ 18	
Plow Steel.	18 00	@ 12 1/2	
TIN PLATES.			
10x14 C Charcoal.	8 50	@ 9 00	
Banca Tin.	24 00	@ 24	
Australia.	19 00	@ 20	
ZINC.			
By the Cask.	11 00	@ 11	
Zinc Sheet 7x3 ft, 7 to 10, lb.	11 00	@ 11	
7x3 ft, 11 to 14.	12 00	@ 12	
8x4 ft, 8 to 10.	12 00	@ 12	
8x4 ft, 11 to 10.	12 00	@ 12	
NAILS.			
Assorted sizes.	3 00	@ 3 25	
QUICKSILVER.			
By the lb.	47 00	@ 50	

## GENERAL MERCHANDISE.

[WHOLESALE.]

WEDNESDAY M., August 15, 1877.

BAGS—Jobbing.			
Eng Standard Wheat, 11½x12½	3 00	@ 3 25	
Neville & Co's	3 00	@ 3 25	
Hand Sewed, 22x36, 11½x12½	3 00	@ 3 25	
22x36.	3 00	@ 3 25	
Machine Sewd, 22x36, 11½x12½	3 00	@ 3 25	
Flour Sacks, halves.	8 25	@ 11 00	
Quarters.	5 00	@ 6 00	
Light.	4 00	@ 5 00	
Heavy.	4 00	@ 5 00	
45 inch.	9 00	@ 9 00	
40 inch.	8 00	@ 8 00	
Wool Sacks.	8 00	@ 8 00	
40 inch.	8 00	@ 8 00	
Machine Sewed.	45 00	@ 45 00	
4 lb.	50 00	@ 50 00	
Standard Gunnies.	14 00	@ 14 00	
Bean Bags.	7 00	@ 8 00	
CANNIES.			
Crystal Wax.	19 00	@ 20 00	
Eagle.	12 00	@ 12 00	
Patent Sperm.	28 00	@ 30 00	
CANNED GOODS.			
Assorted Pie Fruits.	2 75	@ 3 00	
24 lb can.	3 75	@ 4 00	
Table do.	3 75	@ 4 00	
Jams and Jellies.	4 25	@ 4 50	
Pickles, h. gal.	3 50	@ 3 75	
Sardines, q. box.	1 65	@ 1 80	
Boys.	3 00	@ 3 00	
Preserved Beef.	4 00	@ 4 00	
do Beef, 4 lb. doz.	5 00	@ 5 00	
Preserved Mutton.	4 00	@ 4 00	
2 lb. doz.	4 00	@ 4 00	
Preserved Ham.	5 00	@ 5 00	
2 lb. doz.	5 00	@ 5 00	
Deviled Ham, 1 lb.	5 00	@ 5 00	
do Ham, 1 lb. doz.	3 00	@ 3 00	
COAL—Jobbing.			
Australian, ton.	9 00	@ 9 50	
Guatemala.	7 00	@ 7 00	
Bellingham Bay.	9 00	@ 9 00	
Seattle.	7 00	@ 7 00	
Cumberland.	14 00	@ 14 00	
Mt Diablo.	4 75	@ 5 75	
Lehigh.	22 00	@ 22 00	
Liverpool.	8 50	@ 9 00	
West Hartley.	9 00	@ 9 50	
Scotch.	8 25	@ 9 00	
Scranton.	13 00	@ 16 00	
Vancouver Id.	9 00	@ 9 00	
Charcoal, sack.	75 00	@ 75 00	
Coke, hbl.	60 00	@ 60 00	
Sandwich Id, lb.	21 00	@ 21 00	
Costa Rica.	18 00	@ 20 00	
Guatemala.	18 00	@ 20 00	
Java.	25 00	@ 25 00	
Manilla.	19 00	@ 19 00	
Ground, in cs.	25 00	@ 25 00	
FISH.			
Sacto Dry Cod.	5 00	@ 6 00	
do in cases.	6 00	@ 7 00	
Eastern Cod.	7 00	@ 7 00	
Salmon, hbls.	9 00	@ 10 00	
Ht hbls.	4 75	@ 5 25	
do cases.	3 00	@ 3 00	
Pick Cod, hbls.	22 00	@ 22 00	
Ht hbls.	11 00	@ 11 00	
Mackerel, No. 1.	14 00	@ 15 00	
Ht Hbls.	14 00	@ 15 00	
In Kits.	3 00	@ 3 25	
Ex Mes.	3 50	@ 4 00	
Pkld Herring, h. 3 00	3 50	@ 4 00	
Boston Sunk Hg.	40 00	@ 50 00	
LIME.			
Lima, St. Cruz.	2 00	@ 2 25	
hbl.	2 00	@ 2 25	
Cement, Rose.	2 75	@ 3 50	
dale.	2 75	@ 3 50	
Portland.	4 75	@ 5 50	
Plaster, Golden.	3 00	@ 3 25	
Gate Mills.	10 00	@ 12 50	
Land Plaster, 10 00	12 50	@ 12 50	
Assorted sizes.	3 25	@ 4 00	
OILS.			
Pacific Blue Co's	1 00	@ 90 00	
Neatfoot, No. 1	1 00	@ 90 00	
Oleum, No. 1	1 00	@ 90 00	
Baker's A.	25 00	@ 25 00	
Olive, Plagnol.	5 25	@ 5 75	
Poseol.	4 75	@ 5 25	
Palm, lb.	8 00	@ 8 00	
Liquid, Raw, hbl.	8 00	@ 8 00	
Boiled.	85 00	@ 85 00	
Cocoonut.	80 00	@ 80 00	
China nut, ca.	68 00	@ 70 00	
Sperm.	1 00	@ 1 00	
Coast Whales.	60 00	@ 65 00	
Polar, refined.	60 00	@ 60 00	
Lard.	1 10	@ 1 15	
Oleophane.	27 00	@ 27 00	
Devols.	27 00	@ 27 00	
Photoline.	29 00	@ 29 00	
Nonpareil.	50 00	@ 50 00	
Eureka.	22 00	@ 25 00	
Barrel kerosene.	45 00	@ 45 00	
Downer Ker.	45 00	@ 50 00	
Elaine.	45 00	@ 45 00	
PAINTS.			
Pure White Lead.	34 00	@ 10 1/2	
Whiting.	14 00	@ 14 00	
Yellow.	14 00	@ 14 00	
Char.	14 00	@ 14 00	
Paris White.	24 00	@ 24 00	
Ochre.	34 00	@ 34 00	
Venetian Red.	34 00	@ 34 00	
Avoril.	34 00	@ 34 00	
Paint, gal.	2 00	@ 2 00	
White & tints.	2 00	@ 2 40	
Green, Blue & Yellow.	3 00	@ 3 50	
Light Red.	3 00	@ 3 50	
Metallic Roof.	1 30	@ 1 60	
RICE.			
China No. 1, lb.	55 00	@ 6 1/2	
Hawaiian.	5 00	@ 5 1/2	
SALT.			
Cal Bay, ton.	13 00	@ 14 00	
Common.	6 00	@ 8 00	
Carmen Id.	13 00	@ 14 00	
Liverpool fine.	18 00	@ 18 00	
SOAP.			
Castle, lb.	10 00	@ 10 00	
do in cases.	11 00	@ 11 00	
Fancy brands.	7 00	@ 7 00	
SPICES.			
Cloves, lb.	45 00	@ 45 00	
Ossis.	85 00	@ 85 00	
Nutmeg.	85 00	@ 85 00	
Pepper Grain.	15 00	@ 15 00	
Pimento.	15 00	@ 15 00	
Mustard, Cal.	1 50	@ 1 50	
lb in cases.	1 50	@ 1 50	
SUGAR, ETC.			
Cal Cubo, lb.	13 00	@ 13 00	
Powdered.	13 00	@ 13 00	
Fine crushed.	13 00	@ 13 00	
Granulated.	10 00	@ 10 00	
Nutmeg.	10 00	@ 10 00	
Hawaiian.	10 00	@ 10 00	
Cal Syrup, kgs.	70 00	@ 70 00	
Hawaiian Molasses	26 00	@ 26 00	
Young Hyson.	35 00	@ 35 00	
Moynoe, etc.	35 00	@ 35 00	
Company pkd Gun.	35 00	@ 35 00	
powder.	50 00	@ 50 00	
Hyson.	30 00	@ 30 00	
Poco-Chow O.	35 00	@ 35 00	
Japan, 1st quality	40 00	@ 40 00	



LEATHER.

[WHOLESALE.]

WEDNESDAY M., August 15, 1877.

Sole Leather, heavy, lb.	26 00	29
Light	22 00	24
Jodot, 8 Kil. doz.	43 00	45 00
11 to 13 Kil.	48 00	50 00
Second Choice, 11 to 13 Kil.	52 00	54 00
Cornellian, 12 to 15 Kil.	57 00	59 00
Female, 12 to 15 Kil.	63 00	65 00
14 to 15 Kil.	67 00	69 00
Shimono, 15 to 18 Kil.	72 00	74 00
14 to 15 Kil.	76 00	78 00
16 to 17 Kil.	80 00	82 00
Shimono, 18 Kil.	85 00	87 00
20 Kil.	90 00	92 00
24 Kil.	95 00	97 00
Robert Calif, 7 and 9 Kil.	35 00	37 00
Kipsa, French, lb.	1 00	1 35
Cal. doz.	40 00	45 00
French Sheep, lb.	1 00	1 25
Eastern Calif for Backs, lb.	1 00	1 15
Sheep Roans for Topping, all colors, doz.	5 50	6 10
For Linings	1 75	4 50
Cal. Russa Sheep Linings	4 00	4 25
Root Legs, French Calif, pair.	4 00	4 25
Good French Calif.	5 00	5 25
Best Jolot Calif.	5 00	5 25
Leather, Harrow, lb.	35 00	37 00
Pair Bridle, doz.	33 00	35 00
Skirting, lb.	30 00	32 00
Welt, doz.	18 00	20 00
Buff, lb.	17 00	19 00
War slide.	17 00	19 00

Gold, Legal Tenders, Exchange, Etc.

[Corrected Weekly by SUTRO & Co.]

SAN FRANCISCO, August 15, 3 P. M.  
LEGAL TENDERS IN S. F., 11 A. M., 954. SILVER, 95 1/2  
GOLD IN NEW YORK, 105 1/2  
GOLD BARS, 95 1/2 @ 95. SILVER BARS, 94 1/2 @ 95 cent. dis  
count.  
EXCHANGE ON NEW YORK, 1 1/2; on London bankers, 45 1/2;  
Commercial, 45; Paris, five francs @ dollar; Mexican dollars  
94 1/2 @ 95.  
LONDON CONSOL, 94 1/2 @ 95; Bonds, 107 1/2  
QUICKSILVER IN S. F., by the tank, @ 1b. 60c.

Signal Service Meteorological Report.

Week Ending August 14, 1877.

HIGHEST AND LOWEST BAROMETER.							
Aug. 8	Aug. 9	Aug. 10	Aug. 11	Aug. 12	Aug. 13	Aug. 14	Aug. 15
29.98	29.94	30.05	30.00	30.04	30.01	29.94	
29.89	29.88	29.99	30.02	29.95	29.92	29.87	
MINIMUM AND MAXIMUM THERMOMETER.							
62	65	64	65	62	62	62	
62	63	65	65	58	53	53	
MEAN DAILY HUMIDITY.							
84	80	82	80	82	86	86	
PREVAILING WIND.							
SW	SW	W	SW	SW	SW	W	
WIND—MILES TRAVELED.							
261	229	318	255	266	204	265	
STATE OF WEATHER.							
Foggy	Fair	Fair	Foggy	Foggy	Foggy	Foggy	
RAINFALL IN TWENTY-FOUR HOURS.							

Total rain during the season, from July 1, 1877, 0.02 in.

MERCED, July 8, 1877.

Messrs. DEWEY & Co.—Gentlemen:—It is with no small  
degree of satisfaction that I acknowledge the receipt of  
the letters patent for my invention, "The Moth Trap Bee-  
hive," in yours of July 3d. You will please accept my  
highest appreciation and kindest regards for the skillful  
and expeditious manner with which you have prosecuted  
my patent. I have the most unbounded confidence in  
your integrity as gentlemen of high moral principles, and  
to your efficiency in all your departments of business, and  
I will hereby cheerfully recommend all who wish to ob-  
tain letters patent, to employ without delay, Messrs.  
Dewey & Co. You may rest assured that my business,  
should I have any more in your line, will be transacted  
through you. Yours truly,

THOS. A. ATKINSON.

There are many persons who do not know how to stop  
a newspaper. They are more awkward about it than a  
country boy stealing his first kiss. The way to do it with  
satisfaction to both sides is to address the publisher by  
letter if you do not live near enough to call at his office.  
It is no way to notify the postmaster or some one else.  
Four postmasters in three will fail to notify the office of  
publication. They look upon it as your business more  
than theirs. The right way is as gentle and pleasant as  
the other is suspicious and shabby. If you owe for a few  
weeks or months or over time, tender the amount due.  
It is a little thing, but it will be a great satisfaction to  
your conscience, as every one is presumed to have one of  
some kind. Stop your newspaper like a man, and your  
own self-respect and the esteem of the publisher is main-  
tained. Then you can always look him in the eye or take  
him by the hand, and he will feel proud to think you were  
once one of his most gentlemanly patrons, and wish you  
would subscribe again.—Exchange.

WOODLAND, CAL., Aug. 8th, 1876.

Messrs. DEWEY & Co.—Gents:—Your letter contain-  
ing patent for my Centennial churn has come duly to  
hand, and you will please accept my many thanks for the  
prompt manner in which you attended to the business in-  
trusted to your care, and I will take great pleasure in re-  
commending you to any one having anything to attend to  
in your line. I am having a number of the churns put up,  
which will be ready for sale in a few weeks.  
Yours truly, JAMES ROOT.

SANTA CLARA, CAL., April 6th, 1875.

Messrs. DEWEY & Co.—Gents:—We have just received  
Patent No. 160,535, for J. T. Watkins & Co.'s Mammoth  
Road Grader, which was patented through your Agency.  
It is the nearest and best that we have ever received. We  
feel proud of it and thankful to you for the care and at-  
tention that you have given it, and when we have any-  
thing to do in that line of business, we will surely give you  
a call. Very respectfully, J. T. WATKINS & CO.

APPRECIATION ABROAD.—We copy the following from the  
Mining and Monetary Gazette, of London, England: "We  
deemed it advisable, as affording valuable information to  
our readers, to publish in recent issues of The Gazette,  
the full text of the 'United States Mining Laws and In-  
structions, by the Commissioner of General Land Office,'  
taken from our talented contemporary, THE MINING AND  
SCIENTIFIC PRESS, of San Francisco. The documents have  
now been issued in a handsomely bound volume by  
Messrs. Dewey & Co., the publishers of our transatlantic  
contemporary, and it will be found very useful to those  
already interested in American mines, and to others who  
may be tempted to embark in that enterprise in the  
States."

Facts for Pacific Coast Inventors.

MINING AND SCIENTIFIC PRESS  
PATENT AGENCY, S. F.

Our reputation as Patent Solicitors has been  
obtained by long experience, painstaking in our  
work, and fair dealing with our clients. We  
charge reasonable fees and do our work well.  
We charge for each case according to the amount  
of work involved. Our cases are prepared by  
members of the firm who have been in the busi-  
ness over twelve years, and we do not intrust  
the preparation of cases to boys or employees.  
A firm that employs boys at five and six dollars  
per week to write specifications, can afford to  
advertise and take cases at a uniform rate of \$20  
or \$25 a case, but the inventor does not usually  
find it the cheapest plan to employ such aid. If  
it is worth a hundred dollars to prepare a case  
and secure a patent, we charge a hundred dol-  
lars. If we can afford to do the business for  
twenty dollars, we only charge that much. A  
blacksmith might as well advertise that he will  
do all kinds of jobs from the shoeing of a horse  
to the ironing of a wagon for one price, as for a  
patent solicitor to say that he can prepare and  
prosecute all kinds of cases (and do them right)  
for any one fixed price. It is not common sense.  
And if we were the inventor we should at once  
distrust the agent who made us the proposition.  
We would think that he was in the habit of  
slighting his client's work. If a person will  
send us his model, so that we can see what we  
have to do, we will tell him what we can do his  
work on that case for, and we always satisfy  
our clients. We have succeeded in securing the  
patronage of every inventor who has taken his  
work from Eastern agents and given us a fair  
trial. We do the work better and more  
promptly. The inventor can come and see us  
and explain matters orally, if an explanation is  
required, and if we make a mistake or fail to  
do our duty, he can always reach us with a  
"long-enough pole."

DEWEY & CO.,  
202 Sansome street. S. F.

To Mining Secretaries.

An amendment to Section 336 of the California Code,  
taking effect July 1st, 1874, provides that in addition  
to the regular publication, daily or weekly, of the assess-  
ment and sale notices as heretofore,

PERSONAL NOTICE

Must be served as provided in the following quotation  
from the law:

"The notice must be personally served upon each  
stockholder, or in lieu of personal service, must be sent  
through the mail, addressed to each stockholder at his  
place of residence, if known, and if not known, at the  
place where the principal office of the Corporation is sit-  
uated."

The above refers to the ASSESSMENT NOTICE only.  
Advertisers in the MINING AND SCIENTIFIC PRESS  
will be furnished with copies of assessment notices printed  
on slips suitable for serving personal notice under this  
law at short notice.

DEWEY & CO., Publishers.

Mining and Other Companies.

Persons interested in incorporated shares  
will do well to recommend the publication  
of the official notices of their companies  
in this paper, as the cheapest appropriate  
medium for the same.

Bella Union Quicksilver Mining Company.

Location of principal place of business, San Francisco,  
California. Location of works, Napa County, California.  
Notice.—There are delinquent upon the following de-  
scribed stock, on account of assessment No. two (2), levied  
on the twenty-eighth day of June, 1877, the several  
amounts set opposite the names of the respective share-  
holders, as follows:

Names.	No. Cert.	No. Shares.	Am't
Donnell, E. J.	36	100	\$10 00
Donnell, E. J.	37	100	10 00
Donnell, E. J.	38	100	10 00
Donnell, E. J.	39	100	10 00
Donnell, E. J.	40	100	10 00
Donnell, E. J.	41	100	10 00
Donnell, E. J.	42	100	10 00
Donnell, E. J.	43	100	10 00
Donnell, E. J.	44	100	10 00
Donnell, E. J.	45	100	10 00
Donnell, E. J.	46	100	10 00
Donnell, E. J.	47	100	10 00
Donnell, E. J.	48	100	10 00
Donnell, E. J.	49	100	10 00
Donnell, E. J.	50	100	10 00
Donnell, E. J.	51	100	10 00
Donnell, E. J.	52	100	10 00
Donnell, E. J.	53	100	10 00
Donnell, E. J.	54	100	10 00
Donnell, E. J.	55	100	10 00
Donnell, E. J.	56	100	10 00
Donnell, E. J.	57	100	10 00
Donnell, E. J.	58	100	10 00
Donnell, E. J.	59	100	10 00
Donnell, E. J.	60	100	10 00
Donnell, E. J.	61	100	10 00
Donnell, E. J.	62	100	10 00
Donnell, E. J.	63	100	10 00
Donnell, E. J.	64	100	10 00
Donnell, E. J.	65	100	10 00
Donnell, E. J.	66	100	10 00
Donnell, E. J.	67	100	10 00
Donnell, E. J.	68	100	10 00

Name.	No. Certificate.	No. Shares.	Amount.
Donnell, E. J.	69	100	10 00
Donnell, E. J.	70	100	10 00
Donnell, E. J.	71	100	10 00
Donnell, E. J.	72	100	10 00
Donnell, E. J.	73	100	10 00
Donnell, E. J.	74	100	10 00
Donnell, E. J.	75	100	10 00
Donnell, E. J.	76	100	10 00
Donnell, E. J.	77	100	10 00
Donnell, E. J.	78	100	10 00
Donnell, E. J.	79	100	10 00
Donnell, E. J.	80	100	10 00
Donnell, E. J.	81	100	10 00
Donnell, E. J.	82	100	10 00
Donnell, E. J.	83	100	10 00
Donnell, E. J.	84	100	10 00
Donnell, E. J.	85	100	10 00
Donnell, E. J.	86	100	10 00
Donnell, E. J.	87	100	10 00
Donnell, E. J.	88	100	10 00
Donnell, E. J.	89	100	10 00
Donnell, E. J.	90	100	10 00
Donnell, E. J.	91	100	10 00
Donnell, E. J.	92	100	10 00
Donnell, E. J.	93	100	10 00
Donnell, E. J.	94	100	10 00
Donnell, E. J.	95	100	10 00
Donnell, E. J.	96	100	10 00
Donnell, E. J.	97	100	10 00
Donnell, E. J.	98	100	10 00
Donnell, E. J.	99	100	10 00
Donnell, E. J.	100	100	10 00
Donnell, E. J.	101	100	10 00
Donnell, E. J.	102	100	10 00
Donnell, E. J.	103	100	10 00
Donnell, E. J.	104	100	10 00
Donnell, E. J.	105	100	10 00
Donnell, E. J.	106	100	10 00
Donnell, E. J.	107	100	10 00
Donnell, E. J.	108	100	10 00
Donnell, E. J.	109	100	10 00
Donnell, E. J.	110	100	10 00
Donnell, E. J.	111	100	10 00
Donnell, E. J.	112	100	10 00
Donnell, E. J.	113	100	10 00
Donnell, E. J.	114	100	10 00
Donnell, E. J.	115	100	10 00
Donnell, E. J.	116	100	10 00
Donnell, E. J.	117	100	10 00
Donnell, E. J.	118	100	10 00
Donnell, E. J.	119	100	10 00
Donnell, E. J.	120	100	10 00
Donnell, E. J.	121	100	10 00
Donnell, E. J.	122	100	10 00
Donnell, E. J.	123	100	10 00
Donnell, E. J.	124	100	10 00
Donnell, E. J.	125	100	10 00
Donnell, E. J.	126	100	10 00
Donnell, E. J.	127	100	10 00
Donnell, E. J.	128	100	10 00
Donnell, E. J.	129	100	10 00
Donnell, E. J.	130	100	10 00
Donnell, E. J.	131	100	10 00
Donnell, E. J.	132	100	10 00
Donnell, E. J.	133	100	10 00
Donnell, E. J.	134	100	10 00
Donnell, E. J.	135	100	10 00
Donnell, E. J.	136	100	10 00
Donnell, E. J.	137	100	10 00
Donnell, E. J.	138	100	10 00
Donnell, E. J.	139	100	10 00
Donnell, E. J.	140	100	10 00
Donnell, E. J.	141	100	10 00
Donnell, E. J.	142	100	10 00
Donnell, E. J.	143	100	10 00
Donnell, E. J.	144	100	10 00
Donnell, E. J.	145	100	10 00
Donnell, E. J.	146	100	10 00
Donnell, E. J.	147	100	10 00
Donnell, E. J.	148	100	10 00
Donnell, E. J.	149	100	10 00
Donnell, E. J.	150	100	10 00
Donnell, E. J.	151	100	10 00
Donnell, E. J.	152	100	10 00
Donnell, E. J.	153	100	10 00
Donnell, E. J.	154	100	10 00
Donnell, E. J.	155	100	10 00
Donnell, E. J.	156	100	10 00
Donnell, E. J.	157	100	10 00
Donnell, E. J.	158	100	10 00
Donnell, E. J.	159	100	10 00
Donnell, E. J.	160	100	10 00
Donnell, E. J.	161	100	10 00
Donnell, E. J.	162	100	10 00
Donnell, E. J.	163	100	10 00
Donnell, E. J.	164	100	10 00
Donnell, E. J.	165	100	10 00
Donnell, E. J.	166	100	10 00
Donnell, E. J.	167	100	10 00
Donnell, E. J.	168	100	10 00
Donnell, E. J.	169	100	10 00
Donnell, E. J.	170	100	10 00
Donnell, E. J.	171	100	10 00
Donnell, E. J.	172	100	10 00
Donnell, E. J.	173	100	10 00
Donnell, E. J.	174	100	10 00
Donnell, E. J.	175	100	10 00
Donnell, E. J.	176	100	10 00
Donnell, E. J.	177	100	10 00
Donnell, E. J.	178	100	10 00
Donnell, E. J.	179	100	10 00
Donnell, E. J.	180	100	10 00
Donnell, E. J.	181	100	10 00
Donnell, E. J.	182	100	10 00
Donnell, E. J.	183	100	10 00
Donnell, E. J.	184	100	10 00
Donnell, E. J.	185	100	10 00
Donnell, E. J.	186	100	10 00
Donnell, E. J.	187	100	10 00
Head, A. E.	17	1000	100 00
Head, A. E.	18	1000	100 00
Head, A. E.	19	1000	100 00
Head, A. E.	20	1000	100 00
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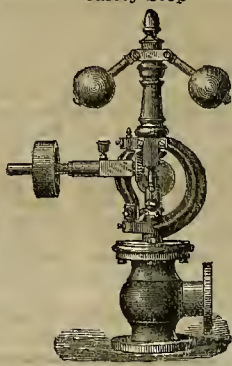
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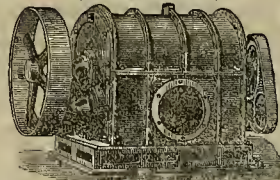
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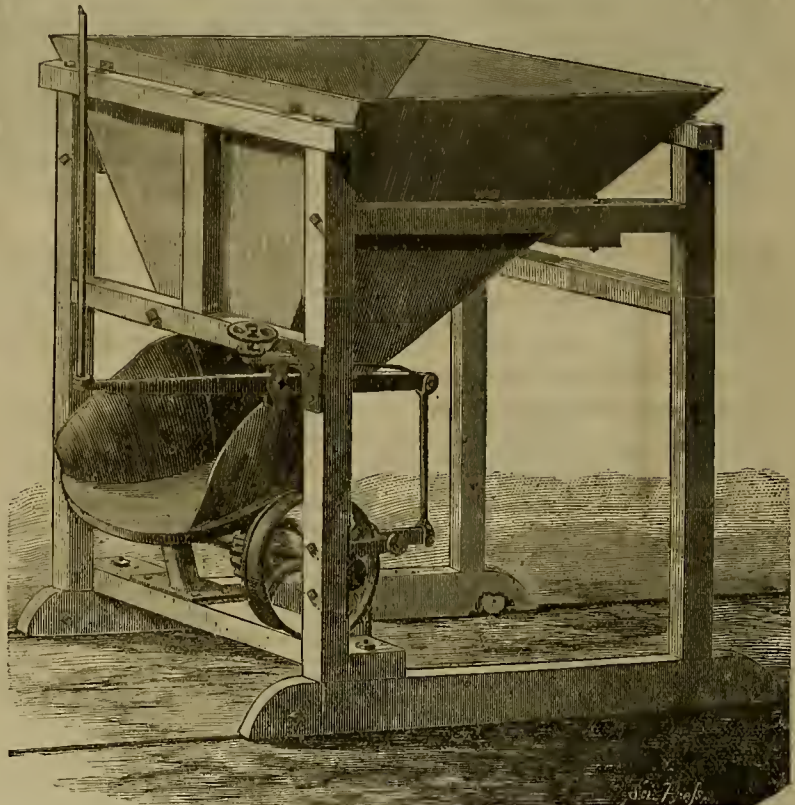
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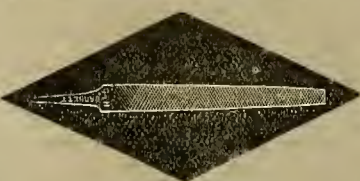
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## UNITED STATES

Mineral Land Laws, Revised Statutes, AND INSTRUCTIONS AND FORMS UNDER THE SAME.

We have just issued a pamphlet containing the General Mineral Land Laws of the United States, with instructions of the Commissioner of the Land Office. The contents of this pamphlet comprise all of the Government laws with relation to mineral lands of interest to the mining community, as follows: Mining Statute of May 10th, 1872, with instructions by the Commissioner of the Land Office; Mining Statute of July 26th, 1866; Mining Statute of July 9th, 1870. Forms required under Mining Act of May 10th, 1872, as follows: Notice of Location; Request for Survey; Application for Patent; Proof of Posting Notice and Diagram of the Claim; Proof that Plat and Notice remained Posted on Claim during Time of Publication; Register's Certificate of Posting Notice for Sixty Days; Agreement of Publisher; Proof of Publication; Affidavit of \$500 Improvements; Statement and Charge of Fees; Proof of Ownership and Possession in Case of Loss or absence of Mining Records; Affidavit of Citizenship; Certificate that no Suit is Pending; Power of Attorney; Protest and Adverse Claim; Non-Mineral Affidavit; Proof that no Known Veins Exist in a Placer Claim, etc. There is also given the U. S. Coal Land Law and Regulations thereunder. The work comprises thirty pages, and will be sold, post-free, for 50 cents. It should be in the hands of every one having any mining interests. DEWEY & CO., Publishers of the MINING AND SCIENTIFIC PRESS, S. F.

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OUR FRIENDS can do much in aid of our paper and the cause of practical knowledge and science, by assisting Agents in their labors of canvassing, by lending their influence and encouraging favors. We intend to send one but worthy men.

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# MINING AND SCIENTIFIC PRESS.

An Illustrated Journal of Mining, Popular Science and General News.

BY DEWEY & CO.,  
Patent Solicitors.

SAN FRANCISCO, SATURDAY, AUGUST 25, 1877.

VOLUME XXXV.  
Number 8.

## Items of Interest from the Mines.

We give below items of interest from prominent mines, most of which are collated from letters of the respective Superintendents on file at the offices in this city:

In the Hussey Cou. mine the stopes from the 120-foot level are looking well. Ore is being hauled to the mill to free the dumps, so that the ore from the 230-foot level can be placed by itself.

The Leopard mill is running nicely, and every prospect of continuing right along. The stopes between the 5th and 6th levels are in good shape, and will yield 25 tons per day easily. Above the 4th level they are all opened out.

Operations at the Chollar mine for the week ending the 18th, show the following results: Number tons extracted, 502 400-2000; Number tons forwarded to mills, 487 700-2000. Average assay of ore mined, \$21.75 per ton.

The ledge in the New England is about two feet wide, and will pay about \$30 per ton.

The Crown Point letter of the 20th, says: The south drift, 2000-foot level, has now reached a depth of 330 feet from starting point in main east drift. This leaves us 120 feet yet to run to connect with the joint pump shaft. The ground continues hard and dry, and the drift is making good progress, having made 43 feet last week. The joint pump shaft now lacks about 40 feet on the incline of our 2000-foot level. We have partially reopened the 160, 230 and 300-foot levels. The work thus far has been chiefly clearing and straightening up old drifts, winzes, etc. At several points we have encountered small streaks and spots of ore, but as yet the work has not been advanced sufficiently to determine its extent or quality. Some of the ore is very good, though most of it is of low grade and in mixed ground, requiring considerable assorting.

The various drifts in the Eureka Con. mine are being carried forward at the usual rate, with very encouraging prospects throughout the respective levels. The 3d level drift has passed through the hard limestone formation mentioned in last report and has come into easier working ground with very good indications of ore in face of drift. The 5th level ore body is looking exceedingly well and still shows no signs of diminishing. The 6th level ore body shows some improvement over last week and is looking very well. The ore body mentioned as having been struck on the 10th level shows decided improvement, and looks as though it would prove the best body of ore ever found in the mine. The main east drift has now been advanced 100 feet since coming into this ore, with the face of drift continuing in ore. Two cross-cuts, each 25 feet long, have been run through this ore at different points, and are still in ore. The ore in drift and cross-cuts is quite rich, carrying a good percentage of lead, and making it first-class ore for smelting. The furnaces have been running well during the week, yielding upwards of 25 tons daily, and aggregating over 353,000 pounds of bullion.

In the Justice the 1150-foot level is freed from its watery element and operations resumed on the east drift, the face of which shows very fine stringers of quartz of a metal-bearing character; assays from \$3 to \$11 per ton. The vein on the 1000-foot level from south lateral drift shows a regular and well-defined body of ore containing considerable metal.

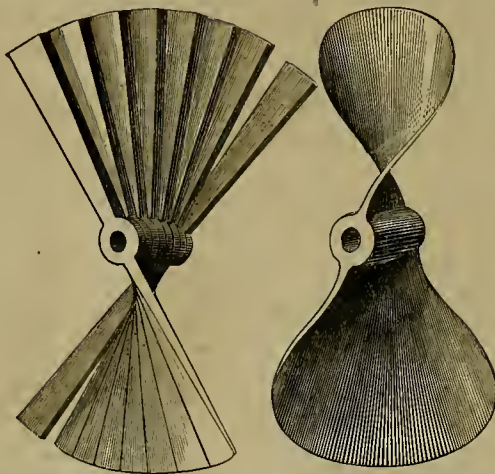
The wages on the Eureka Con. suit amount to over \$25,000.

**BULLION SHIPMENTS.**—Since our last issue shipments of bullion from prominent mines have been as follows: Grand Prize, 16th, \$13,300; Endowment, 16th, \$3,098.63—total to date, \$8,378.80; Martin White, 13th, \$12,022.63; Grand Prize, 16th, \$13,286.60; 20th, \$13,300; Leopard, 20th, \$3,600; Standard, 16th, \$25,454; Con. Virginia, 16th, \$178,368—total to date, \$276,762.27; California, 16th, \$135,756.83—total to date, \$403,723.99; Northern Belle, 14th, \$5,246.41; 16th, \$4,753; Tyho Con., 14th, \$4,068—total to date, \$7,092; Northern Belle, 19th, \$9,941.35; California, 21st, \$159,829.85—total to date, \$563,553.84; Con. Virginia, 21st, \$185,807.67—total to date, \$462,569.94.

## New Method of Making Propellor Patterns.

We give herewith an illustration of a new method of making patterns for propellers, so as to get a true screw by mechanical means, without the necessity of calculation and drafts. The new method was designed by Mr. Otto Osten, a mechanic of this city. As shown in the engraving, a number of pieces of wood are planed to the same size, and placed on a piece of iron threaded on its upper end, so that a nut may clamp them together. They are then spread out to the required pitch and marked on both ends with a pair of compasses. All the wood outside the marks is then taken off. The pieces are smoothed up, clamped and glued together, and the pattern is made. After being clamped the pattern is narrowed at the hub and rounded at the tips to make it neater.

This gives all the curves true with no guess work, as is too often the case with the method in vogue. It ought to reduce the cost of propellers, as the pattern is so simply made. Propellor patterns are the most difficult jobs to do around a foundry; a true screw is difficult to



PLAN OF MAKING PROPELLOR CASTINGS.

make, and then they are not always sure of being correct.

Several propellers have been made as samples from this style of pattern, and can be examined at the shop of E. H. Thompson, 228 Main street. After the pattern is made, before it is glued together, the purchaser may examine and see if the pitch suits him; or he can set the pieces of wood before the pattern is made and get exactly the pitch he wants. Where it is desired to have the propeller curve inwards at the tip to prevent slip, the pieces of wood are made a little thicker at the tips so that the screw can be made accurately. We have seen several of the patterns made on this principle, by Mr. Osten, all of which were very correctly made. Any ordinary mechanic can make one as it takes no scientific knowledge to prepare plans and drawings before the pattern makers take hold of the work.

The Eureka Sentinel says: Senator Sharon invested \$30,000 of his surplus capital in Eureka Consolidated shares last week, paying therefor \$36 per share. It was a private transaction, and illustrates the mining magnate's confidence in the future of the mine.

The last bar of gold, valued at \$9,000, has been shipped from the Eureka mine, to San Francisco. That completes the clean-ups. That mine has done nobly in yielding precious metal, and hundreds will regret to learn that work has been suspended on it forever.

**COPPER.**—The latest Liverpool quotations for copper are: Good ordinary brands, £68 15s. to £69; special brands, up to £70 per ton; ore, 13s. 6d. to 13s. 9d.; and regulus, 13s. per unit. The market has remained about stationary for the past month.

## Academy of Sciences.

The regular meeting of the California Academy of Sciences was held on Monday evening last, Prof. Davidson in the chair. The following donations to the cabinet were received: From Prof. Davidson, magnesite from Fort Point, San Francisco; from Dr. H. D. Cogswell, specimens of cement from the walls of the tower of Ramleh, 12 miles from Jaffa, on the road to Jerusalem; also, specimens from the walls of Jerusalem; from the Acropolis, or citadel, of Athens, 150 feet above the plain; also porphyry from the mosque of Omar, at Jerusalem. From C. D. Gibbs, six specimens of pyrites crystals, auriferous, from Calaveras county, Cal. By exchange, six specimens of crystals of calcite, found in Geodes, north of Church Buttes, Wyoming; and lead ore, from Bingham canyon, Utah. From W. J. Downing, bones picked up at Purissima; and specimens of madrono, with a curious growth enclosing a horse shoe hung on it ten years ago, presented as a curiosity. Dr. Kellogg read a paper on the following plants: *Eriogon ericoides*, T. and G., from Mr. John

## Saws—A Fine Exhibit.

Just to the right as you enter the pavilion is one of the most extensive, expensive and instructive displays in the whole building. We refer to the polished article that revolves upon the partition and revolutionized the lumber trade of the world, saws. Tastily arranged and of every kind known to modern use, except the diamond toothed saw used for cutting stone, there is no more valuable or beautiful display in the whole building than that of the Pacific Saw Manufacturing Company, composed of Messrs. Spaulding, Patterson and Sheffield. The manufacture of saws is one of the most ancient of all mechanical industries, they being in use among the old Egyptians and Greeks. By the latter, the inventor was deified with the title of Talus or Perdix. With us, the manufacturer of the best saw is dignified and blessed by all mill-men, and in this list come Messrs. Spaulding & Co. He being the inventor and patentee of the movable teeth, so much in use in circular saws, has greatly improved the superiority of circular saws of the old style used. The value of their exhibit may be calculated by the knowledge that the largest circular is worth near \$500, and the smallest saw in the collection about 50 cents. The longest sash, or "muley" saw in use in the State is by the Noyo mill, in Mendocino, which was made on a special order for the sawing of the large slab exhibited some years ago in the fair. The saw is 16 feet long, and with it was sawn a redwood board 12 feet long and 7 feet wide. The art of forging and tempering mill saws is one that can be acquired only by the best and most intelligent workmen, and the low price of lumber, and the strong competition in the trade, have forced our mill-men to employ the best and most improved machinery in the trade. This has brought Messrs. Spaulding & Co.'s goods extensively into use, as, being right at home, any little defect in a saw can be quickly remedied when brought to their notice, and any peculiarity required in them, or adjustment to any special machinery, can be made to order. They also make saw mandrels and arbors a specialty. They have attached helting to some 14 saws in their exhibit, so as to display them in motion, though not at the speed at which they would be driven when actually at work, and then playfully put up notices to the public not to handle.

Their factory is at Nos. 17 and 19 Fremont street, where they have a very extensive establishment, and many thousands of dollars of stock for inspection and sale.

## Fine Castings.

The Aetna Iron Works, Pendegast & Smith, proprietors, make an exhibit in the line of iron castings, which, though a single piece, is of a shape probably the most difficult our foundries have to deal with. It is a large propeller for the steamer Ajax, and weighs 10,600 pounds. It is fourteen feet in diameter, being the largest in size and weight ever cast on this coast. This is the fifth one of this pattern built for the Ajax. In running up the coast the steamer meets a good many large logs which get away from the numerous mills up there, and she has in each case broken her propeller by coming in contact with these logs.

These iron works make a specialty of propeller casting, having on hand patterns for fourteen different sizes. The large one referred to is set up so as to be revolved slowly, and several other smaller sized propellers are within the railing on the floor.

In the same exhibit are a number of patterns of ornamental iron work for house fronts. The Aetna Iron Works also make a specialty of this class of work, orders for which have greatly increased of late years among us. The designs shown are very handsome and much more ornamental than can be made durable in wood. A great variety of these designs is kept on hand, and, of course, new ones are made to order. Altogether the display is quite creditable, and if the example of the Aetna had been followed by more of our foundrymen the general public would have been more favorably impressed with the extent of our iron manufacturing resources.

The Imperial Government of China has issued an edict against the use of opium, declaring its use was bringing destruction upon the Chinese people. In addition to home production, opium is imported into China to an annual value of over \$40,000,000, principally from British India.



## The Pacific Coast.

[Written for the PRESS.]

The author of "Vestiges of Creation," long before this coast was settled by its present population, advanced the idea that on the portion of our continent lying west of the Rocky mountains, and bordering on the Pacific ocean, would grow a people, who for physical power and mental force would surpass all other portions of the globe. More than a million people are now upon this side, and although we of today cannot arrogate to ourselves this distinguished standard of greatness, and will leave it to those of the coming years, yet there are brains in our midst whose spreading powers have already electrified the world by their bold enterprise and successful achievements. And here I refer to Messrs. Stanford, Crocker, Huntington and Hopkins—men who, in the face of the best advice of friends to the contrary, and unaided by friendly capital in the first instance, threw their all into the venture, started, pushed, and finally completed one of the hold-est feats of the age—the building of the Central Pacific railroad—the spanning of the Sierra Nevadas, overcoming their rugged heights, and bidding defiance to mountains of almost perpetual snow. Some will say Government money built it, in part. Granted; but did it not take brains of no ordinary cast—first to grasp the enterprise, secondly, to form the plan of operation, thirdly, the force, tact and capacity to draw the millions piled on millions, to execute and complete it. I never travel over this line but there goes forth a throb of pleasure and appreciation for the brains that conceived and executed it. Let them rear their palaces of beauty, and amass their millions, unenvied—they are the rewards of industry and intellectual force. Not only this, but the applause of the people should be for such men, who, year after year, open new fields for the laboring element of three States and one Territory, and give employment to more than a thousand white men daily. Would it not be a splendid thing for labor, if we had a few more such spirits on this coast, and should such benefits not be appreciated?

Our mining enterprises, too, though we are so young in years, are equal, in stupendous machinery, purpose, depth, yield of the precious metals, and wealth of our adventurers, with any part of the mining world. Our manufactures we have built up, and worked against the odds of paying the highest rewards for labor of any country on the face of the globe.

To, us travelers accord the tribute of being the most independent, off-hand, decided and free thinking of communities. It is said the ocean, whose sight sets thought free, gives freedom to the people. That we are possessed of great individuality of thought there can be no question. Some who stop not to analyze our better natures declare us an unchristian people. Free thought rides in every brain, call it what you will, but Christianity, comes in charitable outpourings, when suffering humanity sends forth its appeal.

This is the race of to-day; we are the fathers of the coming generation who are to fill up the demands of this seer's prophecy. Building upon the foundation and record of more than quarter of a century, such as this coast can present from the pioneer days to the present, much certainly can be expected from the future. We have plowed the cereal grounds, made smooth the rugged mountain passes, studded the highways with homes, planted the vine and fig tree, and perfumed the atmosphere with the orange blossom and the rose. We have built cities, opened commerce, started schools of learning, of arts and sciences, and now bid fair, soon, by our telescope, to sweep further into the mystic expanse than ever Herschell dreamed of. Thus we of to-day have made easy the life of the coming generation. That they will be thinkers and hold operators there are evidences on every side. The capacity, brightness and individuality of the educated youth of to-day challenges the world for their equal. It is natural it should be so, reared, as they are, upon a new soil, solid and invigorated by the vivacity originating in the life, spirit and dash of the golden days gone by, all going to make up strength, holdness and intellectuality. Our worse element of youth, is physical and mental force needing direction and education in the higher ideas of civilized life.

It is this live, individualized, solid, vigorous, metalized spirit of the land, that is going to make the future blaze with the holdest enterprises and grandest outpourings of brain force, and which will make this coast the central point around which the civilized world will revolve. San Francisco is yet to be the peer of London, and the monied power of the world. Central as we are between the great cities of the orient and the occident, and the depot of the trade and commerce of both, how can it be otherwise? It only wants time and brains to shape our destinies.

Our mountains are filled with treasure, and with more unlocked, than the world scarce dreams of, which even now, is filling our coffers monthly with millions of new coined gold and silver.

The year 1900 will bring forth, in a measure,

the realization of the prophecy, and then the hardy pioneers who laid the foundation of so splendid a future, will be known only as the wild gold hunters of the nineteenth century.

ALMARIN B. PAUL.

San Francisco, August 1877.

## The Granite Creek (Oregon) Mines.

A correspondent of the *Bedrock Democrat*, traveling through the mines of Eastern Oregon, gives an account of them, from which we condense as follows: From one of the oldest inhabitants we learn that gold was first struck on Granite creek about the first of June, 1862, by a prospecting party that came through by the way of Auburn. On the 3d day of July following, a company from Jacksonville, Oregon, accompanied by a pack train, loaded with provisions and liquors, encamped on the present site of Independence. They laid over the next day for the purpose of celebrating our national birthday. Learning of the presence of other miners on the creek, Jack Long purchased a bottle of whisky from the packer, and started out to interview them. When a short distance from camp, his mule mired in Granite creek, whereupon he returned for a pick and shovel, declaring his intention to sink a hole under that mule for luck; the remaining members of the party jokingly encouraged him. Jack was as good as his word; after extricating the mule, he continued sinking to the depth of about four feet, where he washed out 25 cents to the pan. This excited everybody, claims were staked off immediately, and a town laid out, which was very appropriately named Independence, it having been located on Independence Day. Granite creek has been worked for about 15 miles of its length, giving employment at one time to 1,200 miners. These have gradually disappeared, with their bags of gold, in search of greener fields, their places being partially taken by the almond-eyed heathens, until now only six claims in and about the place are owned and worked by white men. One of these, however, on Onion gulch, owned by Messrs. Lynch & Co., is quite important. They cleaned up 437½ ounces, yesterday, after a run of two months and a half with five men. The gold in this claim is of a very fine quality. It sold last season for \$18 per ounce in the bar, losing but 4% in melting. At this rate the company will realize over \$7,000 for their season's work so far. Water will last a month longer. The ground is comparatively inexhaustible. Messrs. Bowen & Lucas own and work extensive claims on Granite, and Mr. M. Stevens on Last Chance. These are said to be good; no results reported as yet. The glory of Granite creek, as a placer mining camp, has probably departed forever, but will undoubtedly in the near future be known to fame as one of the richest quartz mining regions on the Pacific slope.

The correspondent goes on with an account of several quartz mines in the vicinity, all of which are silver bearing. Numerous assays have been made of the ore, from the surface down to the various depths attained, by competent assayers, and the results are such as to justify extravagant statements in reference to their richness. The owners of the ledges are men who live here, and will develop their mines as rapidly as circumstances will admit. Having taken a general survey of this locality, we returned to the Rattler, in order to give it a more thorough inspection. This ledge has been traced along the surface for 2,500 feet. Its direction is a little east of north and west of south, which, by the way, is the direction of all the veins in this section. Several shafts have been sunk, all showing about the same. In the bottom of the main shaft, which is 50 feet deep, the vein is 18 inches wide of solid ore. The assay of this one, in silver, ranges all the way from \$26 up into the thousands. A tunnel, designed to strike the ledge at a depth of 165 feet, is now completed to the distance of 285 feet. It is calculated to reach the ledge within the next 50 feet. The cost of development so far has been \$7,000. The owners, Messrs. Klopp, Nail, Deguire, White, Wegner, Back, Waukup and Trione, have exhibited almost unparalleled perseverance in the prosecution of this enterprise. The tunnel has been blasted all the way through hard granite. If the ledge shows as well where the tunnel strikes it, as it does on the surface, the value of the mine can be hardly estimated.

**FLUE DUST.**—The working of the fine dust at the Lemmon mill is progressing very favorably. The proprietors find no trouble in extracting the silver and lead, but the gold contained in the dust has as yet eluded the process. This trouble is laid to the coarseness of the article, and it is being run through the sample mill at the Consolidated works. It is thought that by grinding it to the required fineness all of the precious metals can be saved. The roaster is working well, and the pans, concentrators and agitators, although of an old-fashioned pattern, are doing much better work than was anticipated. Some trouble has been experienced with the machinery, its long disuse and necessity of adapting it to the work causing some delay. The firm are very much encouraged with their experiments, and have no fears of the ultimate success of the enterprise. The importance of the new process, in the event of its success, can hardly be exaggerated, adding, as it does, 13% to the value of every ton of smelting ore extracted from the mines of the district.—*Eureka Sentinel*.

## Salt for Working Ores.

The *Virginia Enterprise* gives the following account of the Eagle Salt Works, which furnish the supply of salt for the mills:

The amount of common salt used in the mills working ores from the Comstock range is from 300 to 400 tons per month, there being less used in winter than during the summer, as the tailings mills (which use a great deal of salt) are then running much lighter, owing to the difficulty experienced in drying slimes.

The salt used in our mills all comes from

The Eagle Salt Works,

Situated on the line of the Central Pacific railroad, 16 miles east of Wardsworth. It is a very pure article; it is said that it is absolutely nothing but salt—there being no foreign substance or mineral in it.

Much of the salt shipped from the works is taken off the cars at mills along the Carson river, at Silver City and at Gold Hill. It is put up in strong sacks, of a size convenient for handling, and arrives here in excellent condition. The salt sells at a cent and a half per pound, or \$30 per ton by the car load. A car holds about ten tons.

How the Salt is Obtained.

Contrary to the generally-received opinion, the salt is not procured in a marsh by digging it out of or scraping it up from the ground. At the place where the salt is found there is nothing resembling a marsh; instead there is seen a large basin or sink, the surface of which is covered with sand. This basin has no present outlet and presents the general features of an extinct lake—a lake from which all the water has evaporated.

The source of the salt found in the basin has been traced to a ravine, in the head of which a well has been sunk to the depth of 12 feet. Shallow as the well is it affords as much water as can be raised with a six-inch pump. Should an artesian well be sunk at this point the water would no doubt rise to the surface and flow from the well.

The water of the well has but a slightly brackish taste and is as colorless as though it had been distilled. Specimens of the water, in bottles, are to be seen at the store of J. C. Hampton & Co., in this city, Mr. Hampton being the agent for the sale of the salt on the Comstock. He has specimens of the water in all stages of strength or concentration, starting with that just taken from the well and ending with that which has been in the vats 30 days, and which is just on the point of becoming solid crystals of salt; indeed, a specimen but one week in the vats showed at the bottom some crystals of salt.

Reservoirs and Evaporating Vats.

From the well the water is pumped into large reservoirs, where it is allowed to stand for some time, when it is conducted to the evaporating vats. The ground on which the reservoirs and vats are situated is gently descending. Neither reservoirs nor vats are made of lumber, but are built in the earth, and of the earth and sand found on the spot.

The surface of the basin is (as stated above) covered with sand. This sand averages about two feet in depth, and under it lies a stratum of tough clay. The vats are made by scraping away the sand down to the clay, and are 60 feet in width by from 200 to 300 feet in length. There being a slight inclination in the ground the water is gradually passed forward from one vat to another, growing stronger and stronger, until, in the last, it becomes pure salt crystals. There are 10 rows or tiers of these vats, and, in all, they cover an area of about eight acres.

The Process used Partly Leaching and Partly by Evaporation.

By sinking a few feet in the stratum of clay underlying the surface sand (which seems to have blown in off the surrounding deserts) a saline water similar to that obtained from the well is found. This water appears to be drawn up by the sand, when it speedily evaporates, leaving the surface coated to a considerable depth with pure white salt.

Surrounding the vats are reservoirs into which water from the well is conducted. These reservoirs are so loosely constructed that the water oozes out through their banks or walls, and, percolating the intervening sand, finally finds its way into the vats. In passing from the reservoirs to the vats the water leaches out and takes up all the salt formed in the sand and thus gains much in strength. This leaching part of the process is of great advantage in summer, when the evaporation is rapid and salt is quickly formed on the surface of the sand.

The time will doubtless come when the surface sand will be shoveled into wooden vats and leached out as ashes are leached at potash works. Even in the clay, masses or pockets of crystals of pure salt are found.

The company owning the works have store-houses on the railroad. They also grind and put up an excellent article of salt for table and dairy use. Owing to the dryness of the atmosphere the salt put up at the Eagle works is almost entirely free from moisture; whereas that brought from San Francisco is quite damp. Parties have several times undertaken to compete with the Nevada works by bringing salt from California, but on account of the great amount of moisture the article imported contains they have failed to make it a paying business. Doubtless, should the Nevada salt be taken to San Francisco and there stored for a time in the moist atmosphere, it would become, by absorption, quite as damp as that imported from the East.

## Prospecting in the Elk Mountains.

John W. Gilson writes to the *Salt Lake Tribune* an account of a prospecting trip to the Elk mountains, from which we take the following:

Having just returned from Elk mountains, whither I went in company with 26 others, five weeks ago, in search of placer mines, I deem it a duty due your many readers to furnish you with a correct account of our researches in that much-talked-of country.

The Distance

From Salt Lake City to Elk mountains via Salina is about 350 miles, and the route is the same traveled in going to the San Juan mines, until a point is reached 19 miles east of Green river, where we leave the main road, taking a southeast course, reaching the northwest end of Elk Mountain valley, in 25 miles of rough, tedious road. One mile further, and we are standing upon the bank of

Grand River.

Grand indeed is this beautiful stream, with its 600 feet of rapid waters, tearing madly through the craggy cliffs of sandstone from the east, whose summits rise perpendicularly to a height of several hundred feet, and rippling musically through the valley for a distance of two miles, glides swiftly out of sight through a square cut defile in a perpendicular wall, which rises to the height of 1,000 feet, and completely hems in the southwest side of the valley.

The Old Mormon Post.

Crossing the river at this point, we pass over a point of rich meadow land and reach the old Mormon fort, which stands on the northeast side of the valley. A large spring of water breaks out of the hills just back of the fort and flows into the meadow below. The fort is 60 feet square in the clear, built of red sandstone, the walls of which are four feet thick at the base, tapering gradually to the height of 12 feet, the apex of which is two feet thick.

The Gold Prospects

Have caused much talk, and, I am sorry to say, prove unworthy of so much notice. On either side of the creek is a large bar of washed granite, gravel and boulders, lying upon a bedrock of red sandstone. In these bars at the surface from five to fifteen colors to the pan of light flour gold were obtained, which, on sinking, gradually increased, until at the depth of eight or ten feet, wholly disappeared. It was the general impression of the party, although the prospect was not flattering, that these few colors must have come from some place, and we naturally looked to the head of the stream for their source. Acting upon this supposition, a detachment of the party set out for that point, which was reached under difficulty, as the country lying between the valley and the mountains proper is the roughest and most inaccessible of any it has been my fortune to meet with during an experience of 15 years in the mountains. Perpendicular bluffs rising to dizzy heights, rough, rugged and dangerous gorges, whose uncertain depths are awful to gaze into; miles of bedrock washed bare and so smooth that horseback riding is a perilous mode of traveling; then add to this dense thickets of oak brush, rose hushes and several other minor obstacles, and you have a route that the stoutest heart would not crave for, or wish to take a pleasure trip. On our way we prospected all likely and unlikely places, but no where did we find as good a prospect as on the bars in the valley; and where we expected to find the best prospect—that is, at the head of the creek—we found nothing at all, and wherever a color was found, it was of the lightest nature.

Elk Mountains

Are about 35 miles in length from north to south, and are composed of three main peaks with their auxiliaries, the formation of which is a sort of gray granite which only shows itself above the surrounding red sandstone a few feet below timber line. No evidences of old wash, or, in fact, any of the indications common to placer mining countries, were found on the west side of the mountain. The east side is still unexplored, and only in one place was genuine quartz found, which, however, contained nothing of value. The country was not what I called thoroughly prospected by any means, but I believe I speak for the majority of the party when I say I am satisfied that no placer gold exists in paying quantities on the west side of the range.

At the north end of the range we discovered another beautiful valley, much larger than the one already described, and if thoroughly explored, we think would prove equally as well adapted to agriculture. We named this Butte valley, from a round mountain or butte that stands immediately in the center.

**NEW MINES.**—A few weeks ago a half-witted fellow, known as "Bismack," while herding sheep in the Sonoma mountains south of Guthrie's ranch, discovered what he believed to be a coal mine. Shortly afterwards he arrived in town, and informed Jacob Ulrich of his discovery and its locality. Ulrich took a pick and shovel and went with him to the croppings, where he found, instead of a coal mine, a very good prospect for a gold and silver-bearing vein. Since then he has sunk a shaft 23 feet deep on the ledge, and has found it to be a well-defined vein, carrying ore in which there is considerable silver and free gold, and, from what we can learn, the chances are excellent for Bismack's coal mine to prove a valuable silver mine.

—*Silver State*.



## MECHANICAL PROGRESS.

## Heating to Forge.

Of the evil effects of improper and unequal heat in the bar, as it comes upon the anvil, none is more conscious than the man who swings the hammer. Messrs. Miller, Metcalf & Parkin, of Pittsburgh, steel manufacturers, furnish the *American Manufacturer* with a letter on this subject, from which, perhaps, our smiths may get suggestions. They say: As much trouble and loss are caused by improper heating in the forge fire as in the tempering fire, although steel may be heated safely very hot for forging if it be done properly, but any high degree of heat, no matter how uniform it may be, is unsafe for hardening.

The trouble in the forge fire is usually uneven heat, and not too high heat. Suppose the piece to be forged has been put into a very hot fire, and forced as quickly as possible to a high yellow heat, so that it is almost up to the scintillating point. If this be done, in a few minutes the outside will be quite soft and in a nice condition for forging, while the middle parts will not be more than red hot. The highly heated soft outside will have very little tenacity; that is to say, this part will be so far advanced toward fusion that the particles will slide easily over one another, while the less highly tempered inside parts will be hard, possessed of high tenacity, and the particles will not slide so easily over each other. Now let the piece be placed under the hammer and forged, and the result will be that the soft outside will yield so much more readily than the hard inside that the outer particles will be torn asunder, while the inside will remain sound, and the piece will be pitched out and branded "burned."

Suppose the case to be reversed, and the inside be much hotter than the outside; that is, that the inside shall be in a state of semi-fusion, while the outside is hard and firm. Now let the piece be forged and we shall have the outside all sound, and the whole piece will appear perfectly good until it is cropped, and then it is found to be hollow inside, and it is pitched out and branded "burst."

In either case, if the piece had been heated soft all through, or if it had only been heated red hot all through, it would have forged perfectly sound and good. If it be asked, why then is there ever any necessity for smiths to use a low heat in forging, when a uniform high heat will do as well? We answer—In some cases a high heat is more desirable to save heavy labor, but in every case where a fine steel is to be used for cutting purposes, it must be borne in mind that very heavy forging refines the bars as they slowly cool, and if the smith heats such refined bars until they are soft, he raises the grain, makes them coarse, and he cannot get them fine again unless he has a very heavy steam hammer at command and knows how to use it well. In following the above hints there is still a greater danger to be avoided, that is incurred by letting the steel lie in the fire after it is properly heated. When the steel is hot through it should be taken from the fire immediately and forged as quickly as possible. "Soaking" in the fire causes steel to become "dry" and brittle, and does it more injury than any bad practice known to the most experienced.

**CASTING NICKEL AND COBALT IN GERMANY AND IN BIRMINGHAM.**—A scientific correspondent of a Birmingham newspaper says: "Dingler's *Polytechnic Journal* has an article on the manufacture of large castings of nickel and cobalt. The size of castings obtained is spoken of as five to six kilograms (about 10 to 12 pounds), but I much question if the Germans can produce such castings as have been obtained by Messrs. Wiggin & Co., of Birmingham. The apparatus used consisted of a round fire-proof oven, similar in construction to Deville's blast furnace. The crucible was placed on an iron plate in the middle of the furnace. A mixture of coke and charcoal was used as fuel, and air blown in at the rate of seven to nine cubic meters (a cubic meter is somewhat more than a cubic yard) per minute. The best graphite crucibles would not resist the action of the high temperature obtained, so a series of crucibles placed one inside the other was used. During the casting the fluid metal often began to froth up and spurt when it was brought into the molds and cooled, and the resulting casts were not solid, but blistered. To remedy this defect, the molds were surrounded by a stout cotton wick, which had been previously saturated with tar or petroleum. This was ignited as the metal approached the molds and formed a large reducing flame, through which the hot metal was passed. The castings were then allowed to cool slowly."

**JUMPING A BAR.**—A few nights ago a passenger train on the Long Island railroad left Jamaica for Long Island City, and when crossing High bridge, a structure 30 feet high, the locomotive struck an iron bar on the track, which it jumped over and alighted on the rails again, as did the 10 cars following, the eleventh coach pushing the obstacle from the rails. A boy named Thomas Kelly was arrested, and confessed that he and three others had placed the obstruction upon the bridge with the purpose of throwing the train over into the creek, so that they might plunder the dead and wounded.

**PULVERIZING MINERALS.**—A simple apparatus, intended principally for disintegrating superphosphates, clay, earth, coal, or other minerals, has been invented by H. and E. Albert, of Biebrich-am-Rhein, and consists chiefly of a peculiarly constructed open drum and wheel. Upon an axle mounted on suitable bearings is keyed a boss having a disc at one end. To this disc are bolted (say) four arms, near the extremities of which is fixed a concentric ring; parallel to this ring are two other rings of similar diameter, and these rings are connected to the former by a series of cross stays or rods, both at their points of junction with the arms, and also at intermediate points. Thus it will be seen that an open drum or wheel will be formed, having arms at one side only, and mounted upon an axle to which a rapid revolving motion (say, from 300 to 500 revolutions per minute) is imparted by means of a strap or belt passing round a pulley keyed on one end of the axle. The superphosphate or other material to be pulverized is delivered by means of a hopper into the interior of this drum or wheel, and in falling it meets with the cross-stays or rods in their rapid revolution in the reverse direction, and becomes thereby thoroughly pulverized or disintegrated. A movable hood is placed over the upper half of the drum or wheel. In a modification of this invention the hopper is placed so as to deliver the superphosphate or other material on to the outside of the wheel instead of the inside, in which case the drum or wheel may have arms on both sides of the boss.

**STEEL LOCOMOTIVE BOILER.**—A correspondent, traveling on the southwestern division of the Chicago, Rock Island and Pacific line, writes: "The twenty-four locomotives, which have all steel boilers, and which have been in heavy service for six years, are all good; not one of them, to my knowledge, has had a cracked sheet. I have patched some of them in the bottom and corner of the firebox, caused by rust and ashes eating the sheet away, but I believe if I had adopted our present system of holding the grate I would not have had to do this. The system consists of leaving the side of the grate a little loose, so that when the fireman shakes the grate he moves the side bars enough to shake all the ashes from between the side bars and side sheets. If ashes do not collect next the sides of the firebox the sheets will not be rusted away. We also place our grates lower than they are ordinarily placed on other roads, the center of the grate being on a line with the rivets, through the mud ring. We used the 'fingered' rocking grates. I have been using for three months a slide valve with ports  $\frac{1}{4}$  by 10 inches and 13-16ths, outside, and scant 1-16th inside lap. The cylinder is 16 by 22 inches, and I think the engine works better in all respects than it did with the old valve with ports  $\frac{1}{4}$  by 15 inches and the same lap."

**THE VALUE OF SMALL INVENTIONS.**—An excellent exemplification of the large returns which a small invention may often bring to its fortunate originator is found in the experience of Mr. Chas. W. Cahoon, who recently died at Portland, Me. Mr. Cahoon possessed much inventive ability, besides that quality of persistent determination to succeed which usually characterizes the successful inventor. It is said that he realized \$60,000 out of a little lamp burner, which had an appliance for lifting the chimney, so that the wick could be reached for lighting or the mouth of the lamp for filling. This saved the frequent removal of the chimney while hot, and so doubtless prevented many fingers from being burned and many chimneys from being broken. Simple as was this device, Mr. Cahoon studied hard over it, and nearly lost his eyesight by persistent watching of the lamp flame under different conditions. It was the first invention of the kind patented (February, 1861), and infringers were plenty; but Mr. Cahoon protected his rights manfully and triumphed in the end. It is to be regretted that he could not have lived longer to have enjoyed the fruits of his strivings.

**SIGN OF SPEED.**—The Pennsylvania Railroad Company has recently introduced on freight trains a new signal. It consists of a flashing light that indicates the speed and distance of a train, and shows whether it is at rest or in motion. This light is of two colors, one of them red and the other white, placed on the caboose, so that they may be seen in both directions on the line. A simple device for hiding the light at intervals is affixed to each lamp, so that it may be made to alternately appear and disappear, and by suitable gearing this is connected with one of the axles of the car. While the car is at rest the lights are steadily visible; when the train moves the lights flash once for each revolution of the wheels, and thus its movement and actual speed can be easily estimated as far as the lights can be seen.

**STRAIGHTENING A SPIRAL.**—Many watchmakers, says the *Revue Chronometrique*, when they have a spiral to straighten or close up, simply place it flat on a piece of paper or an ivory surface; but the shadow thrown by the spires frequently renders the shape of the spiral indistinct, and does not permit of the distances between the spires being properly judged. A Parisian watchmaker, M. Majoury, overcomes this difficulty in a simple and efficacious manner. He places a watch glass on the bench, the higher the glass the better, and puts the spiral he wishes to repair upon it. The light from beneath causes the troublesome shade to disappear, and every part of the spiral to be clearly seen.

## SCIENTIFIC PROGRESS.

## Discovery of Oxygen in the Sun by Photography.

Professor Henry Draper read a paper before the meeting of the American Philosophical Society, on the 20th of July last, which has been pronounced, by those fit to judge, the most important contribution to solar physics since Kirchhoff's great discovery. Prof. Draper entitled his paper, "Discovery of Oxygen in the Sun by Photography, and a New Theory of the Solar Spectrum." The paper appears in full, with an illustration, in the *American Journal of Science and Arts*, and in the *Journal of the Franklin Institute*. Prof. Henry has demonstrated the existence of oxygen in the sun, by means of certain bright lines in the solar spectrum, which he shows to coincide with the bright lines of the gas as brought out by the electric spark in a so-called Geissler tube. The discovery, too, was made in a new way—not by comparing with the eye the spectra of the sun and of an oxygen tube—but by actually photographing the two spectra side by side. He publishes the photograph (by the Albertype process) just as it was taken, absolutely untouched and unmodified, except by the printing of certain reference letters and figures upon the negative, and any one can see for himself the significant coincidences. The interest of the discovery is two-fold. For one thing, the apparent absence of oxygen and the other non-metallic elements from the atmosphere of the sun has been to all astronomers a puzzle, and to some hardly less than a stumbling-block, greatly in the way of any consistent theory of planetary evolution. The discovery of oxygen, thus inconspicuous, but unmistakable, removes the difficulty, and makes it more than probable that many of the other elements, hitherto unrecognized, may yet be found. The other point of interest in respect to the discovery is the means by which it was accomplished. The difficulties in the way of such a photographic success are enormous, especially as regards the obtaining an oxygen spectrum of sufficient steadiness and brilliance. This was accomplished by new methods. The light itself was, indeed, produced in the ordinary way, by sending an electric spark from a powerful induction coil through a Geissler tube; but the coil itself was worked, not by a current from a galvanic battery, as usual, but by the current from a Gramme dynamo-electric machine, slightly modified for the purpose. And this machine was driven, not by a steam engine, as is commonly the case, but by one of the new petroleum motors, which in steadiness and economy proved itself far better than a steam engine. The apparatus generates a steady stream of sparks, each ten inches long, sixteen every second, and keeps it up for hours, if necessary. Without such appliances the research and discovery would apparently have been impossible.

**INDIA-RUBBER.**—A large number of kinds of trees, remarks the *New York Independent*, give india-rubber, almost every popular rubber district having a tree of its own. The most popular article at present is that from Para, which is from the *Hovea Brasiliensis*. Though the article is in such demand, it has been calculated that, even allowing for increased demand from more numerous populations and increased demand from improved art, there will be no essential diminution in the Para product for the next 100 years. But, besides this, a new rubber tree has been discovered in the Brazilian district of Araçaty. It is, botanically, *Hancornia speciosa*. It comprises the bulk of a single forest district of nearly 1,200 square miles, besides in less abundance elsewhere. It is said to be a very superior article and to bring a higher price than any offered in market. Not long since it was feared that the stock would be exhausted soon; but these facts do not confirm this fear.

**THE DARWINS.**—Mr. Darwin's life is a comfortable one—he has never been obliged to fight poverty and has had plenty of leisure in which to follow his chosen studies. He married his cousin, Miss Emma Wedgwood, and they live in the lovely County of Kent. Mr. Darwin's eldest son, Mr. William Darwin, is a banker at Southampton; the second, George, took high honors at Cambridge, and is now a Fellow of Trinity; the third, Frank, who has inherited his father's ill-health, acts as his secretary; the fourth, Leonard, is an officer in the artillery, and distinguished himself as one of the scientific corps sent to observe the transit of Venus; the fifth, Horace, is an excellent mathematician. One married and one unmarried daughter complete a family whose constant care is to relieve its head of all possible trouble or anxiety.

**THE SOLAR PARALLAX.**—Mr. Pogson, at Madras, will take advantage of the approaching favorable opposition of Mars for a new determination of the parallax. Mr. Gill has left England for the Island of Ascension, to make observations with Lord Lindsay's heliometer.

## Indian Burial Customs.

Mr. H. C. Yarrow, of the Army Medical Museum, Washington, D. C., is preparing a memoir upon the "Burial Customs of the Indians of North America, both ancient and modern, and the disposal of their dead," and seeks information on the following points:

1. Name of the tribe.
  2. Locality.
  3. Manner of burial, ancient and modern.
  4. Funeral ceremonies.
  5. Mourning observances, if any.
- With reference to the first of these inquiries, "name of the tribe," the Indian name is desired as well as the name by which the tribe is known to the whites.
- As to "locality," the response should give the range of the tribe, and be full and geographically accurate.
- As to the "manner of burial," etc., it is important to have every particular bearing on this branch of the subject; and much minuteness is desirable.
- For instance:
- (a) Was the body buried in the ground? If so, in what position, and how was the grave prepared and finished?
  - (b) If cremated, describe the process and what disposal was made of the ashes.
  - (c) Were any utensils, implements, ornaments, etc., or food placed in the grave? In short, every fact is sought that may possibly add to a general knowledge of the subject.
- The memoir will be published by the Government.

**FREE INSTRUCTION IN TECHNOLOGY.**—It is an indication of hopeful progress when we see arrangements made for free imparting of technological truth to those who most desire and need it. We read in an exchange that the trustees of the Lowell Institute have made an arrangement with the Institute of Technology for a free course of instruction in "Practical Design for Manufacturers," open to pupils of both sexes. This class will be in charge of a skillful designer and the instruction will be practical. Designing is to be studied as an art which can be applied to decoration or for patterns for fabrics. Already the design for patterns made by students of the institute have been sent to the factories and made use of for various purposes. The class is under the personal instruction of Mr. Charles Kastner, who was designer at the Pacific Mills for 14 years, and who received his instruction from the best instructors in the art in France. During the next year the managers of this institute will have their looms of all kinds running. Among them will be a pattern loom. The instruction in this department will accordingly be so extended as to make the designer familiar with the weaving of the fabric according to the pattern, including, of course, the intricate and elaborate details of putting the patterns in the form for weaving, which, to the uninitiated observer, looks like a tangled wilderness of twine. It is proposed to unite with the study of chemistry for practical purposes the art of making colors. The instruction will be given by a teacher thoroughly competent and having experience in this important art. The introduction of this useful department will complement the instruction in designing by affording the facilities for making the fabric patterns of the designers in the colors which they desire.

**THE NASHVILLE MEETING.**—The annual meeting of the American Association for the Advancement of Science will be held this year at Nashville, Tenn. It is the twenty-sixth anniversary. Although the society was originally designed for the promotion of pure science, it has broadened its fields by degrees, like its British model, and now treats of almost every non-sectarian and non-political theme. The membership is large and distinguished, and associates are admitted who are interested in the development of industrial resources of every kind. The session commences August 29th, and lasts to September 5th. The principal railroads will sell trip tickets for one fare, and the citizens will entertain all who will accept their hospitality. Excursions have been arranged to Chattanooga, the mineral field of Alabama, and into various portions of Tennessee, as well as to the Mammoth Cave, Arkansas and Texas.

**INGROWING POTATOES.**—Potatoes are often found inside of other potatoes, and it has puzzled physiologists somewhat to account for the occurrence. Rev. M. J. Berkeley has recently examined a case, and finds that it is caused by a bud (eye, as our farmers would call it) pushing inward, instead of outward; or, as he says, it is caused by an "inverted bud." As every one knows, when a potato is formed, it is simply a swelling at the end of a thread sent out from the buds, which start into growth from the eye. In this case Mr. Berkeley found the thread an inch and a quarter long in the potato before the young tuber commenced to form.

**A VALUABLE THERMOMETER.**—Prof. Moritz has published an account of a thermometer he invented about 13 years ago, which he now thinks might be of utility in meteorology. It is a nearly circular band of silver and platinum, fastened at one end, and at the other moving a mirror, the readings being taken from a scale on the mirror, as in a magnetometer.



## Table of Highest and Lowest Sales in S. F. Stock Exchange.

Name of Company.	Week Ending Aug. 2.	Week Ending Aug. 9.	Week Ending Aug. 16.	Week Ending Aug. 23.
Alta.	11	10	10	11
Andes.	80c	60c	70c	70c
Baltimore Con.	40c	40c	40c	40c
Belcher.	3.30	3.10	3.10	3.10
Best & Belcher.	15	14	15	15
Bullion.	7	6	7	7
California.	27	28	28	28
Challenger.	11	11	11	11
Chollar-Potosi.	29	26	30	29
Confidence.	4	4	4	4
Con Imperial.	29	28	30	29
Crown Point.	4	4	4	4
Coso Con.	15c	10c	10c	10c
Dayton.	60c	50c	50c	50c
Eureka Con.	3	3	3	3
Exchequer.	63	59	62	61
Geddes & Bertrand.	20c	20c	20c	20c
Gen Thomas.	12	12	12	12
Grand Prize.	90c	80c	80c	80c
Globe Con.	25c	20c	20c	20c
Golden Chariot.	25c	20c	20c	20c
Gould & Curry.	8	7	8	8
Hale & Norcross.	85c	90c	90c	90c
Hussey.	25c	20c	20c	20c
Julia.	13	11	11	11
Justice.	9	8	9	9
K. K. Con.	4	4	4	4
Kentuck.	4	4	4	4
Knickerbocker.	1	1	1	1
Kossuth.	1	1	1	1
Lady Bryan.	1	1	1	1
Lady Wash.	1	1	1	1
Leopard.	1.40	1.30	1.30	1.30
Leviathan.	45c	40c	40c	40c
Leeds.	11	11	11	11
Modoc.	83	81	81	81
Manhattan.	83	81	81	81
Mansfield.	50c	45c	45c	45c
Meadow Valley.	80c	75c	75c	75c
Mexican.	80c	75c	75c	75c
Northern Belle.	18	17	17	17
Northern Con.	18	17	17	17
Oceana.	75c	40c	40c	40c
Ophir.	15	14	14	14
Overman.	20	14	14	14
Pacific.	10	9	9	9
Phil Sheridan.	90c	55c	1	1
Poorman.	15c	10c	10c	10c
Prospect.	10	9	9	9
Raymond & Ely.	20c	15c	15c	15c
Rock Island.	20c	15c	15c	15c
Sage.	61	51	51	51
Seg Belcher.	23	22	22	22
Sierra Nevada.	1.55	1.45	1.45	1.45
Silver Hill.	1.55	1.45	1.45	1.45
South Chariot.	50c	10c	10c	10c
Succor.	50c	10c	10c	10c
Trojan.	50c	10c	10c	10c
Union Con.	50c	10c	10c	10c
Utah.	50c	10c	10c	10c
Wells-Fargo.	10c	10c	10c	10c
Woodville.	25c	25c	25c	25c
Yellow Jacket.	8	7	8	8

## Sales at S. F. Stock Exchange.

FRIDAY, A. M., Aug. 17.	450	Con Virginia.	28	3.25
175 Andes.	60	Oleandria.	3.70	3.51
135 Alpha.	10	Dayton.	50c	
70 Belcher.	41	Exchequer.	1.40	1.41
130 Bullion.	6	Julia.	1.40	1.41
595 Best & Belcher.	15	Julia.	1.40	1.41
325 Chollar.	22	Julia.	1.40	1.41
280 Crown Point.	3.60	3.50	3.50	3.51
175 Con Imperial.	75c	350 Grand Prize.	13	13.10
485 California.	25	150 Hale & Nor.	4.35	
325 Caledonia.	3.40	250 Jackson.	1.40	1.41
50 Dayton.	10	300 Julia.	1.40	1.41
300 Exchequer.	57	300 Leandria.	3.70	3.51
55 Eureka Con.	37	100 Leandria.	3.70	3.51
220 Gould & Curry.	38	100 Leandria.	3.70	3.51
200 Hale & Nor.	1.50	100 Leandria.	3.70	3.51
115 Justice.	70	100 Leandria.	3.70	3.51
725 Julia.	70	100 Leandria.	3.70	3.51
140 Kentuck.	4	100 Leandria.	3.70	3.51
400 Lady Bryan.	1	100 Leandria.	3.70	3.51
70 Leviathan.	35c	100 Leandria.	3.70	3.51
235 Mexican.	94	100 Leandria.	3.70	3.51
150 New York.	30c	100 Leandria.	3.70	3.51
120 Ophir.	15	100 Leandria.	3.70	3.51
375 Overman.	19	100 Leandria.	3.70	3.51
50 Occidental.	10	100 Leandria.	3.70	3.51
700 Peytona.	1.20	100 Leandria.	3.70	3.51
300 Sage.	51	100 Leandria.	3.70	3.51
210 Sierra Nevada.	3.30	100 Leandria.	3.70	3.51
50 Silver Hill.	1.45	100 Leandria.	3.70	3.51
70 Trojan.	50c	100 Leandria.	3.70	3.51
18 Utah.	10	100 Leandria.	3.70	3.51
220 Union Con.	4.90	100 Leandria.	3.70	3.51
715 Yellow Jacket.	9	100 Leandria.	3.70	3.51
60 Alpha.	10	100 Leandria.	3.70	3.51
100 Argenta.	1.15	100 Leandria.	3.70	3.51
450 Alps.	90c	100 Leandria.	3.70	3.51
455 Belcher.	10	100 Leandria.	3.70	3.51
100 Caledonia.	10c	100 Leandria.	3.70	3.51
400 California.	25	100 Leandria.	3.70	3.51
50 Chollar.	3	100 Leandria.	3.70	3.51
30 Crown Point.	3.50	100 Leandria.	3.70	3.51
70 Con Virginia.	28	100 Leandria.	3.70	3.51
390 Caledonia.	3.45	100 Leandria.	3.70	3.51
1750 DeFrees.	1.40	100 Leandria.	3.70	3.51
700 El Dorado S.	3.40	100 Leandria.	3.70	3.51
55 Eureka Con.	37	100 Leandria.	3.70	3.51
200 Emira Id.	2	100 Leandria.	3.70	3.51
150 Exchequer.	57	100 Leandria.	3.70	3.51
180 Grand Prize.	13	100 Leandria.	3.70	3.51
100 Golden Chariot.	75c	100 Leandria.	3.70	3.51
320 Gila.	80c	100 Leandria.	3.70	3.51
210 Gould & Curry.	38	100 Leandria.	3.70	3.51
70 Hale & Nor.	4.35	100 Leandria.	3.70	3.51
150 Hussey.	30c	100 Leandria.	3.70	3.51
375 Julia.	70	100 Leandria.	3.70	3.51
445 Justice.	8	100 Leandria.	3.70	3.51
50 Jackson.	5	100 Leandria.	3.70	3.51
100 K. K. Con.	4	100 Leandria.	3.70	3.51
1750 Leeds.	2.20	100 Leandria.	3.70	3.51
600 Leopard.	70c	100 Leandria.	3.70	3.51
710 Modoc.	65	100 Leandria.	3.70	3.51
50 Meadow Valley.	75c	100 Leandria.	3.70	3.51
675 New Oso.	75c	100 Leandria.	3.70	3.51
145 Northern Belle.	1.15	100 Leandria.	3.70	3.51
325 Overman.	19	100 Leandria.	3.70	3.51
240 Ophir.	15	100 Leandria.	3.70	3.51
1150 Poorman.	10c	100 Leandria.	3.70	3.51
90 Phenix.	50c	100 Leandria.	3.70	3.51
625 Panther.	30c	100 Leandria.	3.70	3.51
100 Rye Patch.	30c	100 Leandria.	3.70	3.51
135 Raymond & Ely.	14	100 Leandria.	3.70	3.51
210 Sierra Nevada.	3.30	100 Leandria.	3.70	3.51
325 Savage.	30c	100 Leandria.	3.70	3.51
25 Union Con.	4.90	100 Leandria.	3.70	3.51
340 Utah.	10	100 Leandria.	3.70	3.51
120 Yellow Jacket.	8	100 Leandria.	3.70	3.51
SATURDAY, A. M., Aug. 18.				
20 Alpha.	2.35			
320 Alpha.	9			
615 Andes.	70			
220 Alps.	10			
400 Argenta.	1.10			
400 Bullion.	6			
240 Best & Belcher.	15			
630 Belcher.	51			
475 Con Imperial.	80			
50 Chollar.	3			
1145 Crown Point.	3.80			
290 California.	25			

345 Caledonia.	3.60	3.51
430 Crown Point.	4.20	4.15
100 DeFrees.	1.40	1.35
150 Empire Id.	2.40	2.35
1210 El Dorado S.	3.40	3.35
575 Eureka Con.	37	36
320 Grand Prize.	13	12
575 General Thomas.	25	24
780 Gila.	75c	74c
330 Gould & Curry.	38	37
3170 Hussey.	30c	29c
3170 Hale & Nor.	4.20	4.15
600 Jackson.	50c	49c
160 Justice.	8	7
110 Julia.	11	10
55 K. K. Con.	4	3
400 Leeds.	2	1
320 Leopard.	70c	69c
455 Modoc.	65	64
180 Manhattan.	80c	79c
300 Northern Belle.	1.15	1.14
230 Ophir.	15	14
370 Overman.	19	18
1520 Panther.	30c	29c
320 Phenix.	50c	49c
225 Rye Patch.	30c	29c
60 Raymond & Ely.	14	13
30 Seg Belcher.	30c	29c
450 Savage.	30c	29c
50 Utah.	10	9
30 Yellow Jacket.	8	7
TUESDAY, A. M., Aug. 22.		
480 Alta.	2.40	2.35
130 Centuck.	4	3
235 Alpha.	10	9
310 Bullion.	6	5
720 Belcher.	51	50
375 Best & Belcher.	15	14
100 Baltimore Con.	40c	39c
635 California.	25	24
350 Con Virginia.	28	27
15 Chollar.	3	2
370 Crown Point.	3.80	3.75
375 Caledonia.	3.60	3.55
770 Con Imperial.	30	29
5 Confidence.	4	3
430 Exchequer.	60	59
375 Gould & Curry.	38	37
425 Hale & Nor.	4.15	4.10
125 Julia.	11	10
50 Jose Seates.	25c	24c
140 Kentuck.	4	3
185 Kentuck.	4	3
100 Kossuth.	1	0
200 Leviathan.	35c	34c
700 Lady Bryan.	1	0
500 Leandria.	3.70	3.65
615 Overman.	19	18
210 Ophir.	15	14
520 Peytona.	1.10	1.05
235 Savage.	30c	29c
70 Sierra Nevada.	3.30	3.25
10 Seg Belcher.	30c	29c
50 Silver Hill.	1.45	1.40
140 Trojan.	50c	49c
100 Union Con.	4.90	4.85
70 Utah.	10	9
175 Yellow Jacket.	8	7
AFTERNOON SESSION.		
1055 Argenta.	1.15	1.10
100 Belmont.	30c	29c
420 Belcher.	4.90	4.85
210 Best & Belcher.	15	14
355 Con Virginia.	28	27
140 Chollar.	3	2
270 Crown Point.	3.85	3.80
470 DeFrees.	1.41	1.36
1000 El Dorado S.	3.40	3.35
510 Eureka Con.	37	36
110 Exchequer.	60	59
350 Empire Id.	2	1
500 El Dorado N.	50c	49c
280 Gila.	75c	74c
430 Grand Prize.	13	12
540 Golden Chariot.	75c	74c
135 Gould & Curry.	38	37
1250 Hussey.	30c	29c
625 Jackson.	30c	29c
130 Justice.	8	7
675 K. K. Con.	4	3
120 K. K. Con.	4	3
540 Leopard.	70c	69c
200 Leeds.	1.80	1.75

## SALES OF LAST WEEK AND THIS COMPARED

THURSDAY, A. M., Aug. 16.		THURSDAY, A. M., Aug. 23.	
210 Alpha.	2.40	120 Alpha.	1.01
305 Andes.	60	270 Andes.	65
15 Alpha.	10	270 Andes.	65
305 Argenta.	1.15	305 Argenta.	1.15
35 Best & Belcher.	15	350 Best & Belcher.	15
340 Crown Point.	3.60	340 Crown Point.	3.60
340 California.	25	340 California.	25
70 Con Virginia.	28	70 Con Virginia.	28
100 Chollar.	3	100 Chollar.	3
200 Dayton.	50c	200 Dayton.	50c
135 Exchequer.	60	135 Exchequer.	60
240 Gould & Curry.	38	240 Gould & Curry.	38
1035 Julia.	70	1035 Julia.	70
400 Justice.	8	400 Justice.	8
1240 K. K. Con.	4	1240 K. K. Con.	4
500 Lady Bryan.	1	500 Lady Bryan.	1
295 Leandria.	3.70	295 Leandria.	3.70
100 New York.	30c	100 New York.	30c
325 Ophir.	15	325 Ophir.	15
100 Overman.	19	100 Overman.	19
750 Peytona.	1.15	750 Peytona.	1.15
450 Savage.	30c	450 Savage.	30c
230 Sierra Nevada.	3.30	230 Sierra Nevada.	3.30
430 Seg Belcher.	30c	430 Seg Belcher.	30c
270 Silver Hill.	1.45	270 Silver Hill.	1.45
100 Trojan.	50c	100 Trojan.	50c
500 Utah.	10	500 Utah.	10
120 Union Con.	4.90	120 Union Con.	4.90
1700 Yellow Jacket.	8	1700 Yellow Jacket.	8

## MINING SHAREHOLDERS' DIRECTORY.

[Compiled every Thursday from Advertisements in the Mining and Scientific Press and other S. F. Journals.]

## ASSESSMENTS-STOCKS ON THE LISTS OF THE BOARDS.

COMPANY.	LOCATION.	No.	AMT.	LEVIED.	DELINQ'T.	SALE.	SECRETARY.	PLACE OF BUSINESS.
American Flag M & Co	Pioche	10	25	June 23	Aug 18	Sept 17	G R Spinney	310 Pine st
Alps S M Co	Pioche	11	50	July 20	Sept 12	Oct 10	O D Squire	Cor Cal & Monty's
Alpha Con M Co	Washoe	8	100	Aug 17	Sept 22	Oct 13	W Willis	309 Montgomery st
Belcher M Co	Washoe	16	100	July 9	Aug 11	Sept 17	J Crockett	429 California st
Best & Belcher M Co	Washoe	11	100	Aug 8	Sept 13	Oct 1	W Willis	309 Montgomery st
Chollar-Potosi M Co	Washoe	16	50	Aug 4	Sept 6	Sept 24	C A Sankey	331 Montgomery st
Dayton M Co	Washoe	12	300	July 13	Aug 17	Sept 7	W E Dean	419 California st
DeFrees M & Co	Washoe	5	50	July 4	Aug 23	Sept 13	W E Dean	419



# MINING SUMMARY.

The following is mostly condensed from journals published in the interior, in proximity to the mines mentioned.

## California.

### AMADOR.

**THE BONANZA MINE.**—Amador *Dispatch*, Aug. 18: This mine, in Drytown, which has been lying idle for some time past, will be started up again next Monday, under the management of a Mr. Davis, of Ebbelstown. It is thought that the mine can be operated more successfully than it was under the supervision of Mr. Belding.

**MADISON.**—Amador *Register*, Aug. 18: The faction holding the Mahoney works have let a contract to haul rock to the friend mill. They contemplate working some of the very rich ore discovered of late. A quantity of wood is being hauled to the mine, and appearances indicate that work is to be resumed in earnest. The case involving the control of the property is still pending in the court, and it is thought that the consequence will be to leave before the dispute is finally settled.

**STONE CREEK.**—A man named Anderson has been prospecting in Stone creek, about two miles from the Monticlaro mine. He has lately struck a body of quartz two or three feet wide. The rock is said to be of first-class quality.

**FROM YUBA.**—The Rising Sun mine, on the Mokelumne situated below the canal, has been running its new mill for the last week, and are confident that they have a good thing. Steve Kendall has his new mill ready for crushing, but no water. The buyers boys are taking out some good rock near the old Belden mine. Fine is pouncing away in his mines, near the West Point bridge, and the general supposition is that he is making money, as he never says anything. The Yuba tunnel company got their machinery in running order last Thursday, and turned on the water. Most of the business men of the town were on the ground to wish it success, but it was no go. The head of water was too light to run the mill with proper speed. It requires 50 pounds pressure, and the best they could do was to get 40. It runs nicely under that pressure, but not fast enough to do good work. A number of the Trustees were present, but are undecided what to do. It is the general impression, however, that they will have to shut down till the rainy season.

### BUTTE.

**GRANVILLE GRAVEL MINING COMPANY.**—Granville *Mercury*, Aug. 17: This company are engaged in sinking two compartment shafts on the bluff near the depot. The work is progressing rapidly. They are down some 30 feet and are meeting with good success. They have an engine of 20-horse power and a Wilcox pump of improved make, with a capacity of 15,000 gallons per hour. Good pay gravel is already being hoisted, and it is expected that a rich strata of beach gravel to a depth of some 50 feet. John Evans is Superintendent of the company, and operations are being conducted under his direction. He is an old and experienced miner, having an experience of some 20 years in Butte county. He is just the man for the position on account of his fitness and capacity. He assures us that he is determined to reach the bedrock, an undertaking that has never been accomplished in Butte county in her mining history.

**DISCOVERY OF ASBESTOS.**—We have been shown some fine specimens of asbestos recently found near Dogtown. The fibers were long and delicate, and of the usual white and grey color. Parties who own the mine propose to develop it.

The new mining company have abandoned their attempt to get their further claim, and are now working on their claim above the Cape claim, on account of the low stage of water, which will not permit the boat to be floated there.

### CALAVERAS.

**SHERIFF RASSEL.**—Calaveras *Chronicle*, Aug. 18: The principal object of interest on and about the ranch is the Ferguson and Wallace claim. Near the hoisting works they have out 650 tons of rock, worth \$50 per ton. Let us now examine the mine. There are 20 men at work underground, and they take out 150 tons of rock per month. By running levels to the ends of the mine, rock enough can be obtained to keep the new 10-stamp mill employed for three years. Level work of shaft, and east and west drift, claim 1000 feet in length. The mine probably gives employment to 35 men and they all look cheerful, and I know can raise a "jingle." Messrs. Ferguson, Wallace & Earley are building a new 10-stamp mill. Mr. Trump is the millwright, and T. True, C. Chase, C. Wiggins and J. Gallagher, helpers. Mr. Morrill is building a 10-stamp mill for the Littlefield who bought the McFar claim, which joins the Ferguson & Wallace on the east.

### INYO.

**DEFENCE FURNACES.**—Coro *Mining News*, Aug. 18: The Defence company is receiving coal and wood, and on Monday next the furnaces will be started, let us hope for an extended run that will make a big haul. The Superintendent, P. Reddy, Esq., who, for his tenacity and perseverance, is entitled to the warmest considerations of the Darwin public.

We visited the Defence mine yesterday. The drift now being run to strike the second ledge has been run in a distance of 184 feet, the face still being in hard rock, although there is every probability that they will break through into the ledge within a few days. In regard to this drift, for the entire distance, has been extremely hard, but is now becoming softer at the face. The front vein is being worked by contract, and considerable ore being taken out daily.

**MINNETTA BELLE.**—Superintendent W. E. Brown, of the Minnetta Belle, came in last Wednesday, with 3344 pounds of ore for shipment, valued at \$4,500, which went down on the same day. In regard to the mines he reports as follows: The several mines of the company are looking well in all their various workings. The rich ore bodies of the South Minnetta, which are being stopped, are making a splendid showing. The new strike in the Keystone mine is looking very fine, its extent not yet known, but operations have been commenced for the development of this fine ore body to a great depth. The 10-stamp mill, recently purchased by the company from Mr. R. C. Jacobs, is running on rich ores and piling up the silver bricks. Other shipments will follow in rapid succession, there being sufficient amalgam on hand for at least six bars more, besides a large quantity of first-class ore on the mill dumps and at the mines. This company will be compensated through their mill, in regard to the development of this fine ore bodies, but for better facilities of extracting Mr. Rhodda has confined the work to the drifts and cross-ends making from the main tunnel. It is a singular fact that the Cuervo is the only mine in the Darwin district whose ores combine both gold and silver in large, and of course, paying quantities. No ore has been shipped as yet, as the mill is not yet ready, and some of it has gone as high as \$5,000 per ton. It is no uncommon occurrence for our assayers to obtain results high into the thousands from ores in this mine, carrying gold and silver in about equal proportions. There seem to be very little galena or silver-lead ores, such as have here-

tofore been looked for and found; but, on the contrary, gold, native silver, horn silver, chloride and antimonate of lead, the latter very rich in silver. The Cuervo is one of a group of others owned and being operated to some extent. Besides these mines they have a furnace with necessary machinery, a good office and assay building near it, and at the mine they have good assorting sheds, blacksmith shop and all the facilities for economical working.

### NEVADA.

**GOLD HILL.**—Foothill *Times*, Aug. 18: A bonanza, that old mill of the Gold Hill company is proving to the new owners. It will be remembered that we have several times mentioned that a company, consisting of Mr. George Lord, of this place, and Messrs. McClellan, Ivory and others, in San Francisco, had purchased the well-known Gold Hill mine and mill property. This company are already well along with the work of putting on a new and extensive hoisting and pumping works for opening the mine, and last week they began tearing down the old mill, which has been in rather a tumble-down condition, in order to get out the machinery and iron of value. They had been but a short time at work about one of the latteries when it became apparent that amalgam was plentiful in every joint and crack of the wood work and also in the earth below the floors. Over \$2,000 in gold was taken out in a very short time, and it is confidently expected, judging from what has been done, that at least \$10,000 will probably be cleaned up, besides two tons of quicksilver. This will pay the new company back their investment and enable them the mine and \$2,000 worth of machinery and mill, first-class.

### PLACER.

**MINING IRONS.**—Dutch Flat *Forum*, Aug. 16: Mining in this section has almost come to a standstill. The labor is nearly all claimed, and the claim is being carried on. As before stated, the Superintendent of the C. C. Co., kept back in reserve all the water stored in the company's mountain reservoirs for the purpose of extending the opening in this claim. This supply will last about 10 days longer, when the claim will clean up for the season. Unfortunately the opening in this claim happened to be on one of those bad deposits of cemented gravel which are so difficult to remove. The work, however, has been pressed with such vigor that the pit is sufficiently enlarged to admit of advantageous workings at the commencement of next season.

The Southern Cross and Polar Star claims are not washing, but the Superintendent is busily engaged driving powder drifts in every available direction, so as to be in readiness for the early rains.

At Gold Run, the only work being commenced or worthy of note, is a system of powder drifts in the Cedar claims, and the extension of the bed-rock tunnel of the Miners' Ditch Co. This latter work is being done with the aid of two Barleigh drills; the compressors that furnish the air for which, being driven by water instead of steam. We are informed that this work is progressing rapidly. All the old miners are beginning to make preparations for next season.

### TUOLUMNE.

**SHAFT BRANDED.**—Tuolumne *Independent*, Aug. 16: About three o'clock on Tuesday morning, the hoisting shaft and pump works of the Ohio mining company were burned. Two men were in the shaft drilling, and the fire taking from above from some unknown cause, they were warned by the sparks falling in upon them. The great amount of water where they were at work compelled them to wear rubber clothes and hats, and as they ascended to the surface through fire and smoke, these supreme dangers of the mine were, and was finally sold on by Sheriff Torrey for the sum of \$174,500. The Nevada ditch company own a ditch 23 miles long, bringing the waters of the South Yuba river through the counties of Nevada and Yuba into the mines at Sucker Flat. All this property, together with the extensive mining ground of the Golden Gate Consolidated mining company, will be hereafter enough to keep Superintendent Campbell busy.

**MARKS & DARROW.**—We have seen specimens of very fine looking ore, showing free gold disseminated throughout, from the Marks and Darrow mine.

### YUBA.

**SMARTVILLE MINES.**—Cor. Marysville *Appeal*, Aug. 19: It may be interesting to your readers to get a few lines of items from Smartville and vicinity, therefore I take pleasure in noting some matters that have taken place of late in Rose's Bar township. The most important change is in the appointment of Patrick Campbell as general Superintendent of the Smartville mines, and as general superintendent, and also Superintendent of the Nevada Revere, a new company, vice C. L. Kemp, Esq. The property which Mr. Campbell has under his management comprises the most valuable mining and ditch property in Yuba county. The Blue Point and Tunnel company is the claim that the big lawsuit, entitled Lakey vs. Blue Point company, caused such excitement in the District and Supreme courts of the State, and was finally sold on by Sheriff Torrey for the sum of \$174,500. The Nevada ditch company own a ditch 23 miles long, bringing the waters of the South Yuba river through the counties of Nevada and Yuba into the mines at Sucker Flat. All this property, together with the extensive mining ground of the Golden Gate Consolidated mining company, will be hereafter enough to keep Superintendent Campbell busy.

## Nevada.

### WASHOE DISTRICT.

**YELLOW JACKET.**—Gold Hill *News*, Aug. 22: The main drifts, both north and south, at the 2200-ft level, are still in porphyry, with promising quartz seams. In the face of the main drift east more quartz is making its appearance, with porphyry and streaks of clay. The new working shaft to the eastward is making comparatively slow progress downward, by reason of the hardness of the rock.

**JACKIE.**—Daily yield, 350 tons of ore. The ore stops down from the 600 to the 800-ft level are all looking well and yielding the usual amount of milling ore. The up-raise from the 1000-ft level is up 127 feet, and is opening up some very rich ore. The main south drift, on the 1000-ft level, is making the best of progress, the ore in the face showing much improvement.

**CHOLLAR-POTOSI.**—Daily yield, 60 tons of ore, the assay value of which is \$22 per ton. Driving the east drift, on the 1300-ft level, is making steady progress, notwithstanding the intense heat in the face. Sinking the combination shaft is going steadily forward, the rock in the bottom being quite hard. This shaft now only lacks about 20 feet of having reached the level of the Sistro tunnel, and the blasts in face of the tunnel here, which has reached a point 635 feet east of a direct north and south line with the shaft, are heard quite distinctly by the workmen at the bottom of the shaft.

**HALE & NORCROSS.**—Everything in and about the mine is working splendidly, the pumps being in the most perfect order.

Much delay and trouble has been experienced during the past week in the use of the small pumps on the 1300-ft level.

**CON. VIRGINIA.**—Daily yield, 450 to 500 tons of ore. The stopes going southward, on the 1650-ft level, continue in ore of a very rich character. The ore stopes on the 1550 and 1500-ft levels are being worked again, and show no decrease in either the quantity, quality or character of the ore. The heretofore extracted, on the 1400-ft level, the ore stopes are showing finely. The ore stopes on the 1300-ft level are yielding rich ore and promise a long-continued yield of the same character. The ore stopes on the 1200-ft level, going south and west, are opening out splendidly and promise a fine yield for a long time to come. The main drift, on the 1200-ft level, is being carried forward to connect with the shaft at the earliest moment possible. The repairs to the main shaft have been sufficiently completed to admit of the steady use of the two south compartments, and the repairs to the north compartment will be finished by to-morrow. This admits of the resumption of the extracting of ore at every point. On the 1500-ft level the large double winze has reached the 750-ft level, and is now being sunk deeper in order to make room for a sump in case of a heavy body of water being encountered. The north drift from the Gould & Curry, on the 1750-ft level, is steadily advancing along the wall of the ledge, one side of the drift cutting good

ore and the other in clay and porphyry. The heat in the face of the drift is intense. The rate of progress is about two and a half feet per day.

**CALORNIA.**—Daily yield, 650 to 700 tons of ore. The ore stopes on the 1600-ft level continue to yield rich ore. The repairs to the Consolidated shaft are finished, and the extraction of ore has been resumed on both the 1500 and 1550-ft levels, which are looking finely and yielding rich ores. On the 1550-ft level the extraction of ore has been commenced near the south line, the ore, so far as opened upon showing the richest. The branch drift from the C. & C. shaft is being pushed rapidly ahead to reach the ore vein, which it will probably do by the 10th of September. The Consolidated mill was stopped three or four days during the first portion of the week for repairs, but that will make no difference whatever with the bullion result for the month.

**BULLION.**—The repairs to the shaft are still progressing, and temporarily interrupting the steady working of several of the lower levels of the mine. The work has, however, progressed so far as to admit of a resumption of work in the east cross-cut on the 1700-ft level, which will be done to-day.

**UTAH.**—The north drift on the 1150-ft level has struck the quartz vein at a point 80 feet north of where the first east cross-cut terminated. The quartz vein, at that point is just reaching well defined and richest in form, and is in the ledge further to the southward. The ledge in cross-cut No. 1 was 153 feet wide, of solid quartz, and as perfect a vein and ore formation as there is in any mine on the Comstock.

**GOULD & CURRY.**—Sinking the main incline was somewhat impeded by an increased flow of water during the first days of the week. This necessitated the putting in of a donkey pump, since which time the usual fair rate of progress has been made. Sinking the joint winze, on the Savage line, below the 1600-ft level, is being pushed vigorously forward.

**NEW YORK.**—The new pump tank at the 800-ft level operates very advantageously, catching all the water at that point. Very little water comes in below, as the ground is pretty well drained by the deeper mining works in the neighborhood. The bottom of the shaft is 50 feet below the 800-ft level, and a raise is now being made, excavating the third compartment of the shaft up to the 800, from which point it is already completed to the surface.

**BEZLER.**—Daily yield, 50 tons of ore, which is being crushed as fast as extracted, and yields from \$24 to \$28 per ton. Sinking the drain shaft is being pushed forward with the utmost vigor, the bottom in good working ground.

**SOLID SILVER.**—The vein material at the bottom of the winze consists of clay and quartz, about three and one-half feet in width, some streaks of which give high assays.

**BEST & BEZLER.**—Sinking a winze below the 1700-ft level has been commenced at a point 200 feet east of the main north and south lateral drifts, in cross-cut No. 2. This winze will be an incline, and will be sunk to the 1900-ft level, and there connected by means of drifts with the Gould & Curry and Con. Virginia mines.

**SCIRO TUNNEL.**—Total length of tunnel to-day, 17,820 feet. The face of the header is in soft ledge porphyry, with clay seams, requiring constant and careful timbering. Considerable seepage of water is met with. The average rate of advance is about 11 feet per day. The air is of a somewhat high temperature, being 97°, but the ventilation is good.

**LEVATHAN.**—At the 600-ft level the main south drift is being pushed steadily ahead, with the whole face in quartz of an excellent character, with streaks and bunches of good ore.

**OPHR.**—There is no particular change to note of the ore prospecting in the face of the east cross-cut from the bottom of the south winze on the 1300-ft level.

**CALEDONIA.**—The operations on the lower levels of the mine met with delay during the first part of the week, caused by the breaking of the iron clamp which fastens to the bucket of the pump. This has, however, been repaired, and to-day everything is running as usual.

**OVERMAN.**—The east drift, on the 1400-ft level, is being pushed steadily ahead, the face still in porphyry mixed with streaks of quartz and clay. The east cross-cuts, Nos. 1 and 2, on the 1300-ft level, are also making good headway, the face of each being in very favorable ground.

**JULIA.**—The east drift from the main south drift on the 1800-ft level is steadily advancing, the face in much more favorable ground. The south drift on the 1800-ft level is showing some fine streaks of quartz and vein matter.

**LADY BRUCE.**—The hoisting engine is in place, the reels and other machinery are being put into working position as fast as possible, and everything will soon be ready to start up, when active development will be proceeded with.

**SIERA NEVADA.**—The south drifts on the 1700 and 1450-ft levels are each making excellent progress.

**BRISTOL COX.**—Opening a station in the south winze at the 2250-ft level, or 115 feet below the 2135-ft level, is making good progress.

**MEXICAN.**—Driving the north drift on the 1405-ft level and the north drift on the 1000-ft level are making good progress.

**SILVER HILL.**—The water in the shaft appears to be slowly receding instead of rising. It is the supposition that the Sucker shaft is drawing the flow in that direction.

**UNION CON.**—The east drift from the north on the 1300-ft level is making the best of progress.

**ALTA.**—The west drift on the 1050-ft level is showing soft ground and streaks of quartz of a very lively and available character.

### BRISTOL DISTRICT.

**MAYFLOWER MINE.**—Pioche *Record*, Aug. 18: Frank Wheeler returned from Bristol district Wednesday, and reports that on Monday last some rich ore was encountered in the Mayflower mine, assaying from \$135 to \$213; the ore body getting large as the incline is being sunk. Have commenced to take out ore and putting it on the dump. Wheeler took back with him a number of ore-sacks for the purpose of sacking the fine ore in the mine and preventing it from getting mixed with the inferior quality. The vein is about 10 feet in width.

### CORNUCOPIA DISTRICT.

**DULL TIMES.**—Cor. Silver *State*, Aug. 16: Many of our citizens are removing to Tuscarora, thinking that that camp in a short time will rival the Comstock region. This may be true, but your humble correspondent does not believe it. No doubt they have rich mines there, and their shipments of bullion will be large for some time to come, but yet the place is being overdone. When the mills and hoisting works are completed there will be but little work and miners comparatively few, because it takes but a small number to take out all the ore that the mills can reduce daily. In fact, there are not as many miners at work over there to-day as there are here.

**MINING NEWS.**—Here the Leonard is working a large force, and are understanding that on the 15th instant (to-morrow) and that ought to put on many more. Their developments on the 600-ft level bid fair to rival the Grand Prize. The Panther is also looming up, and I think in a short time will astonish some of those who thought heretofore that it was worthless. This company have already purchased first-class machinery for hoisting works, and are now sinking a main working shaft where they will erect their works. The new development of Sullivan & Co. looks better and better every day, and many predict that that claim will be one of the best mines in the northern portion of the State. The Hussey continues about as usual.

### ELY DISTRICT.

**ALPS COMPANY.**—Pioche *Record*, Aug. 18: The development in the winze on 000-ft level of company's Mazepa mine is looking favorable. Drifting in ore, both east and west, commenced in the winze at a depth of 50 feet. A shaft was run from the north portion of the mine, and it was made to-day by N. C. R. R. to the company's mill. Stopping has been commenced on a fine vein of high-grade ore in the west drift of the 400-ft level, in the Company's Washington & Creole mine. Cross-cuts are being run from west drifts, from 10th and 11th levels of Mazepa

mine, and both mines are being vigorously prospected. The mill is running steadily night and day and working satisfactorily.

**THE MINES AT ELY.**—The mine is looking well. There is considerable improvement manifested in the main drift on the 1200-ft level. An increased quantity of ore is coming out of the 1000-ft level. The stopes looking well. The ore stopes on the sixth level are looking much better. Good ore is coming from the first, third and fourth levels; about 20 tons on an average shipped daily to the mill. The mill is still running on tallings, which it will do for the balance of the month.

**A ROCKY TRIP.**—In company with Sheriff McKee, on Wednesday, we made the round trip from Pioche to Bullionville, Panaca, Round, Dry and Rose valleys, and thence back to Pioche. At Bullionville we found the Raymond & Ely's 30-stamp, the American Flag, and the 20-stamp mills busily at work, the latter being engaged in pumping water for the working of the tailings. Work was progressing in concentrating tailings, but the smelting furnace had closed down, and was not to start up until that evening. The shutting down was caused by the inferior grade of ore which they had obtained for iron ore from Bristol, and which had too small a portion of iron in it to work with the concentrations satisfactorily. Four tailing-houses are in operation and the business men of the mine have improved, as they have in the past pay-days having accumulated considerable money around.

**BULLIONVILLE FURNACE.**—The Bullionville furnace started to work again on Wednesday night, having received iron ore enough on which to make a good run.

**WELL START.**—There is a strong probability of the Raymond & Ely's 20-stamp mill at Bullionville starting to work before the month is over.

**PIOCHE BILLIARDS.**—Wells, Fargo & Co. shipped, during the past week, bullion amounting to \$14,276.95.

### EUREKA DISTRICT.

**CONSOLIDATED FURNACES.**—Eureka *Sentinel*, Aug. 18: The furnaces at the Consolidated, new mills are nearly ready for business. No. 4 was finished last Monday and the pipes and tuyeres are in position. No. 2 will be finished on Monday next. In the event of a favorable decision, work will not doubt be crowded and all four of the furnaces put into operation at once. The company is laying in large supplies of wood, coal and timbers, and everybody connected with the mine and works seem to be confident of the judgment being in their favor. This, however, has no particular bearing, as the Richmond people are equally confident, and rumor has it, will start up all of their idle furnaces on the first of September.

**THE CONNOLLY.**—We continue to hear good reports from the Connolly mine. The lowest level is especially promising, and just as soon as certain connections are made it is confidently believed that a large body of ore will be ready for stopping. The mine is in excellent shape in every part.

**HAMBURG MINE.**—Work at the Hamburg mine is progressing very favorably. The contractors, who are sinking the main shaft from the 250-ft level a further distance of 100 feet, are crowding the work with all possible dispatch, and made a progress of 30 feet last week. It is believed that the same dimensions, as from the 250-ft level upward, and will be divided into three compartments. The station at the 250-ft level is completed, and the east and south drifts well under way. The latter has already passed under the Pacific shaft, through the shade, and is in ore. It will connect with the winze from the south shaft, and open out the ore bodies at that point. For the completion of the contract for sinking the main shaft, connection will at once be made with the 400-ft drift from the 400-ft level of the Friday shaft, and a thorough ventilation of the mine thus secured. Everything about the mine is looking very favorable, and but a short time will elapse before smelting is resumed.

**EUREKA CONSOLIDATED.**—The official letter forwarded by the Superintendent of the Eureka Consolidated this week states that, notwithstanding the state of affairs with the mine and furnaces, the bonanza at the fifth and sixth levels shows no sign of giving out, notwithstanding the daily drafts made on it in the way of extracting ore, the furnaces eating up 750 tons a week, all of which is taken from the above levels. The striking of the ore body at that point was a most opportune discovery for the company, coming as it did just at the time when they were about to be taking out the ore from the mine, and by the injunction placed on that part of the mine by order of the court. In the month of July the two furnaces turned out \$159,000, and it is expected, judging by the output so far this month, that the yield will be increased at least \$10,000, which will make a very healthy showing for the Eureka Consolidated treasury. Had it not been for the loss of ore, a little plaster in the shape of an assessment would have been necessary, in view of the pecunes entailed by the lawsuit. Mining experts and lawyers have to be paid, and it takes coin to do it. Still better news for the stockholders is the development of an immense body of ore on the 10th level, which, in the language of the official letter, "looks as if it would prove to be the best body of ore ever found in the mines." The importance of this rich find to the future of Eureka can hardly be exaggerated. It occurs at a depth of 600 feet, and proves that the Ruby fill mines are not only rich in ore but that they will develop further bonanzas as a greater depth is attained.

### MINERAL HILL DISTRICT.

**QUINT.**—Eureka *Sentinel*, Aug. 16: A correspondent from Mineral Hill informs us of the utter stagnation prevailing at that place. Captain Plummer, Superintendent of the English company's mill and mines, is patiently awaiting orders from London before commencing operations. The chloriders are busy getting out ore and working their claims. J. B. Ayres has been appointed Superintendent of the Cold Turkey mine, and his well-known ability will no doubt put the affairs of the company on a satisfactory basis.

### OSCEOLA DISTRICT.

**OSCEOLA DISTRICT.**—Eureka *Sentinel*, Aug. 16: Ed. McSorley is in receipt of a letter from J. M. Coats, a well-known miner, who is trying his luck in Osceola district. He writes that a few points in the future, the writer has arrived in Osceola four days after leaving Eureka, and have been prospecting ever since. I have made two locations in quartz, but have done very little work on them. I have also located 200 acres of placer ground on Weaver creek, on which I am engaged in cutting a drain so that I can get to the bedrock. The ground caves so bad that we will have to put in a covered drain. No one has yet been to the bedrock in the creek, so I cannot tell how it will pan out. I have prospected a gravel ridge running along the south side of the creek (and which our claim covers), and found gold in every pan from the grass roots to the bedrock, which is from five to twelve feet deep. We have found gold in the creek as far down as we could go for water. We are five miles from Osceola. I think this will give you a good idea of the future. The ledges are large, but the ore is of rather a low grade. None of them have been developed to any considerable extent. There is only one shaft in the district that is 100 feet deep. There are some splendid placer claims on the Osceola side of the mountains, several of which pay as high as \$75 a day to the rocker. With a good sluice head of water, they would pay \$100 per day to the rocker. Water haul for the rockers will cost two cents a gallon. The little five-stamp mill is not running at present. Monroe, an old Eureka coal-burner, has the bonanza of the district. It is a quartz claim situated on the divide between Osceola and Weaver creek.

### SILVER PARK DISTRICT.

**CHANGING HANDS.**—Pioche *Record*, Aug. 18: There appears to be some little stir being made in regard to mining property in Silver Park mining district, as several deeds were made out, last Thursday, for mining property in that district.

### WHITE PINE DISTRICT.

**MINING EXCITEMENT.**—White Pine *News*, Aug. 18: We learn that the people of Eberhardt are considerably ex-



## List of Exhibits of the Twelfth Industrial Fair of the Mechanics' Institute.

All entries for competition are marked with an asterisk (\*)—those for exhibition merely with a dagger (†).

- 1.\* S C Higgins: model of locomotive engine
- 2.\* California Pottery Co: display of terra cotta work, balustrade, fountain, vases, chimney tops, statuary and ornaments, vitrified sewer pipe.
- 3.\* J Brownell: specimens of patent chimneys, ventilating tubes, chimney tops and chimney flues.
- 4.\* California Bellows Manufacturing Co: 8 blacksmiths hells.
- 5.† Prescott, Scott & Co: 1 baby hoist geared, 4 to 1, 6x12, 1 Woodward donkey pump No 1, 1 upright engine with boiler 4x6, 1 baby engine 4x10, 1 upright engine 6x8, 1 upright engine 4x6, 1 upright engine 8x10, 1 air compressor No 1, 8x16, 1 air compressor No 3, 16x30, 1 10-inch plunger pump 8-foot shaft, 1 engine 12x30 with Myers cut off.
- 6.\* Snook Bros: specimens of artificial stone, garden and cemetery ornaments, pavement.
- 7.\* W T Garratt: assortment of steam double acting and ship's pumps, boiler and pump combined, hells, boiler and engine, water gates, gas gates, sample of tubing, brass goods, 1 old hell, A. D. 1620.
- 8.\* Hollis, King & Sons: 3 patent portable engines.
- 9.\* Wallace & Co: specimen coffee mill and sausage chopper worked by water power, 1 water engine.
10. Samuel Kellett: specimens of plaster decorations.
- 11.\* Thompson & Upson: specimens of asbestos paints, roofing, cement, steam packing, gas retort cement, hoiler and pipe covering cement, hoiler and pipe covering double air chamber, hoiler and pipe coverings single air chamber, thread, paper, cloth.
- 12.\* Joshua Hendy: 2 Hendy patent concentrators, 2 \$1,000 Challenge Ore Feeders.
- 13.\* Colgate & Co: assortment of laundry soap, toilet soap, perumery and toilet goods.
- 14.† Davis Bros: specimens of hand-carved wooden brackets, machine-carved rustic picture frames, Florida water and fancy goods.
- 15.\* The Gutta Percha and Rubber Manufacturing Co: rubber goods and patent carbolized hose.
- 17.\* Gutta Percha Manufacturing Co: specimens of rubber goods, patent carbolized hose.
- 18.\* Standard Lubricating Co: standard axle grease and standard cream lubricator.
- 19.\* H Williams & Co: Yerba Buena hitters.
- 20.\* Alta Soap Co: display of staple and toilet soaps, and washing powder.
- 21.\* S S Watson: one Watson's improved novelty dishwasher.
- 22.\* McKeone, Van Hagen & Co: specimens of laundry and toilet soap, and Lesh's magic cleaning fluid.
- 23.\* J Grunzel: specimens of ivory and amber work.
- 24.\* Rock Soap Co: staple and toilet soaps, tooth powder and washing powder.
- 25.\* The Selby Smelting and Lead Co: specimens of shot, lead pipe, block tin pipe and sheet lead.
- 26.\* T S Eastman: one hearse, one platform spring extension-top carriage, one three-spring extension-top carriage, one "C" spring-top phaeton, one three spring-top phaeton, one English spring-top buggy, one side bar top buggy, two end-spring open buggies.
- 27.\* San Francisco Cordage Co: specimens of Manila rope, tarred rope, mining rope, oil well rope, lanyard rope, hale rope, sash cord rope, sisal rope, sized and bale rope, plain and tarred yarn.
- 28.\* A L Bancroft & Co: hooks, as specimens of hinding; books as specimens of publication; account books as specimens of manufacture.
- 29.\* The Lattins Spring Bed Manufacturing Co: slat spring beds.
- 30.\* The California Vitrified Sewer Pipe Works: iron stone sewer pipe, fire bricks, chimney flue pipe.
- 31.\* Hucks, Lambert & Co: specimens of H & L axle grease.
- 32 & 33. Huntington, Hopkins & Co: specimens of hardware, two Rider's compression air engines.
- 34.\* Whittier, Fuller & Co: specimens of plate glass, California white lead, French zinc ground in oil, colors ground in oil, brushes, oil and varnish, painters' and artists' material.
- 35.\* Waterhouse & Lester: assortment of carriage goods and hardware, wagon wheels, buggy wheels, carriage springs and axles.
- 36.\* Mrs Jane Sullivan: one case of embroideries, one case stamps and stamped goods.
- 37.† The Pioneer and Eagle Paper Mills: specimens of printing paper, Manila, straw, and blank heavy.
- 38.\* California Bleaching Soap Co: specimens of bleaching soap.
- 39.\* The California Electrical works: electrical apparatus and telegraphic instruments.
- 40.† Boericke & Tiel: Homoeopathic pharmacy, books and goods.
- 41.\* Ernest L Ransome: artificial stone monuments, vases, fountains, statuary, carriage steps, garden rolls, Portland cement ornaments.
- 42.\* One straw burning engine.
- 43.\* Mrs Letheby: globes containing wax flower work.
- 44.\* J W Bones: architectural designs.
- 45.\* W S Townsend: specimens of fancy candies.
- 46.\* Meeker, James & Co: specimens of carriage hardware, spokes, hubs, rims, shafts, single-trees, neck yokes, and buggy wheels.

- 47 & 48.\* R W Brebm: one wood turner's lathe, specimens of wood turning work, California wood.
- 49.\* C L Kendall: Aldine non-explosive burning oil.
- 50.\* John Taylor & Co: specimens of druggist's chemist's and liquor dealer's glassware, and assayer's goods.
- 51.\* Miss S E Morgan: portraits in crayon.
- 52.\* John J Agnelli: lava specimens from the Sandwich Islands.
- 53.\* Will & Finck: California carving sets and general cutlery.
- 54 & 55.\* Wm T Coleman & Co: specimens of chocolate, borax, cement, lye, salmon and oysters, soap, candles and fire extinguisher, fire-proof construction, architect's lathe, and shutters.
- 56.\* Bowen Bros: Bowen's yeast powder.
- 57.\* L Hess: Damiana hitters.
- 58.\* B H Freeman & Co: fancy stair posts, rails and ballisters.
- 59.† Newton & Jenks: Reec's compound fire extinguisher.
- 60.\* John W Quick: screens for quartz, cement, flour and rice mills.
- 61.† T S Clark & Co: spring mattresses, iron bedsteads and bed lounge, woven wire bed spring frame, Union wire mattress.
- 62.† James E Gordon: handles, files, locks, lawn mowers and oil tanks.
- 63.\* Nelson & Dohle: mining and blacksmithing tools.
- 64.\* Alex Mackay: rag carpet, cocoa matting, mats and chair mats.
- 65.\* W F Palmer: edge tools.
- 66.\* Robert Conlter: Wakefield rattan furniture, baskets and fancy articles.
- 67.\* Figer Bros: brushes.
- 68.\* W E Worth: Eureka cement.
- 69.\* G & W Snook: tank water filter.
- 70.\* Pacific Saw Manufacturing Co: specimens of circular, mill, gang, cross-cut, muley, hand, hatcher and scroll saws—planing knives, currier's knives, cabinet scrapers, plasterer's mitering rods, mowing and reaping sections, and saw mandrels.
- 71.† G W Spaulding: patent inserted tooth, circular saws and saw teeth.
- 72.\* Yates & Co: lamps, coal oil stoves, axle grease, vacuum oil hlaeking and machine oil.
- 73.\* Thomas O'Neill: specimens of ornamental, stained, ground, cut, bent and embossed glass.
- 74.\* Harris & Bradley: portable fruit dryer, steam wash hoiler, water heater for dairy use, steam feeder for stock, dried fruits and vegetables.
- 75.† W E Worth: model of elevator, and oil cloth printing machine.
- 76.† Koehler & Ritter: silverware of California manufacture.
- 77.\* San Francisco and Pacific Glass Works: specimens of druggist glassware, pickle, sauce, mustard, beer, soda water, schnapps, gin, hock, wine and claret bottles, brandy flasks, fruit jars, Mason's patent, Mason's improved and Grover Ring, demijohns, elastic demijohn, (C Newman's boxed demijohns and cup flasks.
- 78.\* L H Woodin: Althouse vaneless wind mill.
- 79.\* L Schuman: meerschaum and amber work.
- 80.\* T C Walters: axles and shaft coupling, water filter and cooler.
- 81.\* James E Gordon: weather vanes, lawn mowers, oil tank and handles.
- 82.\* Mrs H A Moore: hair producer.
- 83.\* M C Hawley & Co: regulator windmills, Rice straw burning engines; gold medal separators, Moline gang plow (John Deere), sulky plow (Gilpin), Taylor rakes, perpetual hay press Buckeye new model mower, do S R reaper.
- 84.† M C Hawley: Moline single plow (John Deere), Philadelphia lawn mower, Adams patent self-feeding power corn sheller, running wind-mill pumps.
- 85.\* F Ogden: ore feeder (Tulloch's).
- 86.\* Ward A Hephurn: specimens of avena or oatens grits (Lunt Bros), oysters (A Fields), yeast powder (Dooley's), Pride of Kitchen soap (W L Troxell), condensed milk, Alderney brand.
- 87.\* Joe Poheim: dress cloth suits for gents', business do.
- 88.\* C Pizzala: Italian and French sansages, California make.
- 89.† Berry & Place: scroll saw.
- 90.\* George Nelson: model of ship Independence, hull-rigged.
- 91.\* P J Haven: scroll work done in pavilion.
- 92.† Yates & Co: Reec's patent compound fire extinguisher.
- 93.\* H N Cook: leather belting, hose, hose pipes, canvas bags, mail bags, lace leather, cut lace leather, hydraulic packing, fire buckets.
- 94.\* California Silk Manufacturing Co: specimen of sewing and embroidery, silk, California make.
- 95.† F Flanagan: Centennial cement for mending glass and earthenware.
- 96.† Mrs D A Smith: Bon Ton for the complexion, Sea Foam for the teeth.
- 97.\* J Hendy: lathe driver, Harris' patent, hydraulic elevator, Cranston's, Cocbran's cam, Stanford's patent ore feeder.
- 98.\* Samuel Hill: Florence oil stoves.
- 99.\* A Nachman: wire spring beds, (Champion) Judson's patent.
- 100.\* C H Jenkins: chess table inlaid with different colored woods.
- 101.\* Alta Soap Co: horax soap.
- 102.\* Winants & Co: Self adjusting shoe button fastener.
- 103.\* Heywood Bros & Co: suite rattan furniture, 16 pieces, rattan chairs, cane and wood chairs, upholstered office chairs, cane seat and back sofa.
- 104.† National Drill and Compressor Co: 12-inch steam air compressor, rock drill, hoisting en-

- gine, upright engine and boiler, oil well boring engine with tools.
- 105.\* A J Baling: feathers for hats.
- 106.\* E Higham: Featherless drafting rule for dress cutting, paper patterns.
- 107.\* William R West: Teed's five and six string banjos.
- 108.\* Samuel Bernstein: silver show cases.
- 109.\* S F Morse: "Centennial" cement for mending glass, earthenware, etc.
- 110.\* J O Johnson: feed box.
- 111.\* M Miller: silver show case.
- 112.\* John West: folding tables for sewing and cutting.
- 113.\* Etna Iron Works: steamship propeller, specimens of ornamental and plain castings.
- 114.† T S Clark & Co: hotel cot, jail bedstead, military iron bedstead.
- 115.† Nolan Bros: boots and shoes.
- 116.\* Stanley Rule and Level Co: carpenter's tools.
- 117.† Blackmar & Davis: pianos.
- 118.\* J Landsberger & Co: I X L bitters, and "Dew of the Alps."
- 119.† J Renz: white wine, Reeshing.
- 120.\* Kinsey Lanuis: mineralogical display, galena, silver and gold ores.
- 121.\* John H Mackie: hydraulic sewer traps, Mackie's sewer pipe connection.
- 122.\* Knudsen & Ireland: Adams & Stickney's halloon gas regulator.
- 123.† Hemme & Long: upright pianos.
- 124.\* B Nathan & Co: display of ornamental bronzes, of East India jase-po-ri ware.
- 125.† C F Richards & Co: Trapper's Indian Oil.
- 126.\* Jacob Strahle & Co: inlaid hevel billiard table, black walnut "Nonpareil" gold inlaid billiard table, "Centennial" billiard table, "Champion" billiard table, black walnut Grecian carved billiard table—all with Delaney's patent steel wire cushions.
- 127.\* B Nathan & Co: display of house furnishing goods, refrigerators, ice cream freezers, tea, coffee and chocolate boilers, pans, iron ware, patent student lamps, spice and salt jars, cat teasers, bread cutter, fenders and coal hods.
- 128.† San Francisco Yacht Club: pictures and models of yachts.
- 129.\* B Nathan & Co: display of fancy goods, folding magic mirrors, terra cotta statuary, bisque fruit plate, coupe and saucers.
- 130.\* Wm E Shepman: old work replated.
- 131.\* Gilbert & Moore: school furniture.
- 132.\* R W Jackson: ahalone shell jewelry.
- 133.† A Rushmore: Daniel Judd's patent excavator.
- 134.\* W F Herrick: models of schooner yachts.
- 135.\* Meeker, James & Co: hub hoxing machine, spoke teauting machine.
- 136.\* C J Simmons: Edison's electric pen.
- 137.\* C H & G W Burr: slop hoppers, weather strips.
- 138.\* W O Laughna & Co: asphaltum sidewalks, pavements and roofers.
- 139.\* I & E Emanuel: cabinet furniture.
- 140.\* L W Taper & Co: specimens of photographic India ink, black crayon, life size colored pictures, life size water color pictures.
- 141.† California Furniture Manufacturing Co: display of furniture and upholstery; one enameled bedroom set of six pieces, one walnut bedroom set of three pieces, two spiral spring beds, one woven wire mattress, one easy chair, one parlor set in satin, curtains and cornices, one lamhrequin and drapery in satin and one in plush, one ehyon and ivory cabinet, one center table, one French lounge in plush, one dining room set.
- 142.\* Strahle & Co: display of ivory and composition billiard goods.
- 143.\* J Unna: specimens of brushes, brooms, whisks, feather dusters.
- 144.\* B N Rowley: specimens of coal.
- 145.\* S. F. Journal of Commerce: California flour, display of iron, pateat paper boxes, photo-electrotyping.
- 146.\* W B Ewer: patent photo hackground.
- 147.\* W H Martin: roofing slate.
- 148.\* Goodwin & Co: display of furniture, black walnut bedroom suits, parlor suits, satin Turkish chair, hall chair, book case, library desk, center table.
- 149.\* Bette Spring Co: coach, wagon, platform, side hent, sulky, buggy, compensating side rockaway, express, seat, milk wagon springs.
- 150.† Chartrey & Low: specimens of ornamental and plain castings, and patterns for castings.
- 151.\* Mrs G F Atkinson: one hand quilt.
- 152.\* M C Hawley: rubber helt, rubber hose.
- 153.† H Palmer: specimens of port, sherry, red and white wines, etc.
- 154.† Mills & Leak: glovee and ganntlets.
- 155.† Sumner, Whitney & Co: law hooks and revolving hook cases.
- 156.† Aitken & Lnce: specimen of golden vein marble.
- 157.† Wm M Hendry: iron casting, first one made in California.
- 158.† Land Department Oregon and California Railroad Co: 24 specimens of grain.
- 159.† San Francisco Forge Co: crank axles and stalk holders.
- 160.† Jaccard: case of candies.
- 161.† Jacob Zech: upright piano, grand do, square do, skelton do.
- 162.† Kohler & Chase: grand piano, upright do, square do, organ.
- 163.† American B H O and Sewing Machine Co: sewing machines, the only self threading shuttle machine, self setting needle.
- 164.\* Hall & Kelsaw: steam launch, iron propeller.
- 165.† G H Stipp: specimens of penmanship, etc.
- 166.\* A D Pryal: ornamental tree, called Pryal's golden Italian cypress. † bee hive
- 167.† Mrs A Townsend: 1 globe wax flowers, 1 air castle.

- 168.\* Emerson, Colville & Co: pressed salmon.
- 169.\* M Grey: grand, square and upright pianos.
- 170.† Middlemas & Boole: ship's knees.
- 171.\* Lang & Co: California hock and brandy.
- 172.† Geo A Davis: farm wagon, spring wagon, delivery wagon.
- 173.\* J H Hall & Co: Walton hand washing machine.
- 174.† Mrs Crawford: leather frames, oriental work, rice paper flowers.
- 175.† Mrs Letheby: tapestry 300 years old.
- 176.\* Mrs Letheby: bead work, melon seed bracelets, lace cap, collar do, wax fruit, wax flowers, wax picture.
- 177.\* Mrs Blacket: rice paper flowers.
- 178.\* Miss Maloney: rice paper flowers.
- 179.† Miss M C Bucklin: specimen of tatting and crochet.
- 180.\* J H Small: 1 planing and matching machine.
- 181.\* August Monnier: marble inkstand the whole carved from one block.
- 182.† W F Toothaker: patented eccentric chuck.
- 183.† Carmen Island Salt Works: Carmen Island salt.
- 186.\* Sahier and Co: 2 sacks imperial mill flour.
- 187.\* Warren Cranston: display of cheese.
- 188.\* E J Gould & Co: specimens of Pollsher wool.
- 190.\* Oregon Iron Co: 4 bars of pig iron, 1 bar of pressed iron, 1 casting of iron.
- 191.\* R D Hume: 4 cans of Rogue and Columbia river salmon.
- 192.\* Alden Fruit Preserver: 11 sample cases of dried fruit.
- 193.\* J T Borchers: 2 boxes Columbia spiced sardines, 3 boxes Columbia caviar.
- 194.\* Alley & Co: 1 hottle salmon oil.
- 195.\* Luninucher & Co: 6 calf skins of leather.
- 196.† James Collins: one box of peaches from Grand Island, Sacramento river.
- 198.† J L Pressler: one improved patent grate front.
- 401.† Wm T Coleman & Co: Magnolia Hams.
- 402.\* A W Baker: Boston dress reform undergarment.
- 403.\* J Herzog & Co: Eureka hair.
- 404.\* W H Burton: lawn awning.
- 405.\* W H Campbell: Handasyde's hoiler composition.
- 406.\* J Warren Ball, Esq: specimen of writing.
- 407.† S C Bugbee & Son: architectural drawings and photographs.
- 408.\* W H Burton: drum of hoilers, felted and main steam pipe.
- 409.\* Pitcher & Palmer, Prehel & Co: axle grease.
411. The Chronicle: stereotype plates and monlds.
- 412.\* Raymond Wilscher (Buffalo S Co): scales.
- 413.\* Newsom Bros: architectural drawings.
- 414.\* J Vogeley & Bro: candies, plain, fine and fancy.
- 415.† Journal of Commerce: alfalfa and other hay.
- 416.\* Taylor Goodrick: Magee ranges.
- 417.\* Hucks, Lambert & Green: axle grease.
- 418.\* R E Woods: gopher trap.
- 419.\* Whitfield & Gueren: module, or water meter.
- 420.\* L Savage: drawing school.
- 421.\* S H Nicholson: "Centennial." flavoring extracts.
- 422.\* Williams & Howse: oil stove and fixtures, "Pacific."
- 423.\* Yost & Vanlaere: marble mosaic mantels.
- 424.\* B Graves & Co: carriages, landau extension top rockaway, top buggy, heavy, open piano wagon, Oppenheim jump-seat, no top, do with top, complete unfinished Oppenheim jump-seat, wide track open wagon for country.
- 425.\* Atlantic Bottling Co: lager beer and patent bottles.
- 426.\* Sutton, Stoddard & Voshurg: india ink and water color portraits.
- 427.\* J R Harrington: tylene iron.
- 428.\* T L Merrill: Asbestos, utilized asbestos, steatite, crude and pulverized, asbestos steam packing, asbestos boards, pulverized talc, asbestos brick for lightness, four sample hoilers of wiring and felt covering, wiring of pipe and felting with asbestos hair, steatite roofing, asbestos lining.
- 429.\* A Van Alstine: gums, bitters, phosphorine and cream phenol.
- 430.\* Hamilton & Learned: baby jumper and fancy hoxes.
- 431.\* E A Stockton: step-ladders, patent.
- 432.\* Mrs Wm McBrien: bed spread crochet.
- 433.\* E B Older: oil stoves, "Adams & Westlake"
- 434.\* Sweetser & DeLong: cider vinegar, champagne cider, hard, sweet, boiled and new cider.
- 435.\* Wm Cameron: embroidery goods and patterns.
- 436.\* McMillen & Kester: syrups, hitters, cordials and essences.
- 437.\* Phelps & Miller (Middleton plate Co): plated ware.
- 438.\* Doyle Bros: lot of Japanese goods: Curios as Sasuma, Koto, Ovari, Kaga and Emarle ware, bronze antiquities, implements of war.
- 439.\* Shephard & Co: hair dressers' goods, etc.
- 440.\* J E B Myers: pictures, "Cascades of the Columbia," "Baptism of Covenanters," "Wild Flowers of California."
- 441.\* Eureka Marble Works: marbleized iron mantels and fire grates.
- 442.\* John Mallon: glass, etained, ground, "hent glass special," common hent and embossed.
- 443.\* California Wire Works Co: wire goods, fence, summer house, arches, flower pots, cloth diamond work, riddles, sieves, hird cages, door and window screens.
- 444.\* Salamander Felting Co: hoiler and pipe covering.



## Mining for Gold in Black Sand.

A correspondent of the *Willamette Farmer*, writing from Coquille City, Coos Co., gives a long account of the Black sand mines, from which we extract the following:

The mining region is an old beach, two and one-half miles from the present one. Two companies are working here, about one-fourth of a mile apart. The Black sand is laid in a strata from two to six feet thick and 50 to 100 feet beneath the surface. The "cet," at the mouth of the tunnels, having been sliced out to a depth of 50 feet, the formation is clearly shown, consisting entirely of sand; grey, white, and yellow; old sand dunes, covered with a few inches of soil, and a growth of giant firs and cedars, which might have served in the days of King Solomon, for beams and rafters, for the house of his favorite concubine.

Large trees, lying prone, evidently drift logs, are encountered in the tunnels. At the time of my visit the workmen were cutting through one of unknown wood, 90 feet below the surface. Another, cut through in the same tunnel, a redwood (Sequoia) over four feet in diameter, showed unmistakable evidence of having been subjected to pounding in the surf. These logs are 72 feet above the present sea level, in a hilly, almost mountainous country, made up almost entirely of pure sand carrying a heavy growth of old trees; they tell the story of the lapse of time in this locality, where rolled the boundless Pacific; "hearing no sound save its own dashing;" and the same formation also shows by what imperceptible degrees the waters followed the Star of Empire, and the strip of two and one-half miles of *terra desolata* has been added to the west shore of the American continent. And still the process is going on, and our Uncle Samuel is not only gaining ground, but the tireless ocean is expending its energies for the benefit of man, and continually casting up its golden sands within reach of the lucky miner. The richest sand is said to be on the present beach, where it is covered with water at every tide. Various theories are advanced to explain this gradual receding of the ocean; but perhaps as ingenious and satisfactory as any is that of the sailor, who accounts for it in this wise: That as the earth whirls rapidly to the east, the water being a heavy liquid and easily movable, is unable to keep pace with the motion, and therefore naturally slashes round to the other side. "Quien Sabo."

The black sand is believed to have come from the coast mountains, being brought down by the streams to the sea, and then beat up ashore. This being true, it follows logically that black sand containing gold should be found more or less all along the coast. The sand resembles very fine-grained gunpowder, but is not entirely black. Under a magnifier it shows beautiful, clear, polished black grains interspersed with differently tinted agates, from clear white, and transparent, to a ruby red. The gold is very fine, almost microscopic in its character, and is therefore very difficult to save by ordinary methods. Indeed it is claimed that the sand in the "tailrace" contains twice the quantity of gold that is taken out by the process through which it passes.

At the C. B. M. Co's mine the sand is simply washed in a sluice, and passed over a copper plate covered with mercury; but parties lately from San Francisco are putting up at their mine machines known as the Frue concentrator. This machine consists of an endless rubber belt, having a flange standing up on each edge. About seven feet of this belt lies level laterally, but is inclined lengthwise, so that water will run with a brisk current. The belt is given two motions, by suitable machinery; a shaking motion from side to side, and a slow traveling motion against the current of water flowing over it. On this belt the sand is floated in water and agitated, and the gold shook down to the belt, where it is expected to adhere; the sand passing on down with the water into the tailrace; the gold passing with the belt over the pulley, is jarred and washed off on the under side.

This machine will, it is claimed, save 80 per cent. of the gold. If so, there is a "big bonanza" here, and black sand mining will take a front seat among the industries of Oregon.

**COAL.**—Johnny Bell, engineer on the Eureka and Palisade railroad, took on board a cargo of Palisade coal, Sunday afternoon, and tested its quality on the trip. He reports it as an excellent article of fuel, burning freely and making steam very fast. The mine has improved all the way from the surface to a depth of 50 feet, and great hopes are entertained of eventually striking a stratum of coal that will prove of sufficient extent to warrant the erection of hoisting works. Messrs. Ferguson & Young are running a cross-drift from the bottom of the shaft, but will soon commence to sink again.—*Eureka Sentinel*.

**MINING DECISION.**—The Interior Department has decided that the adverse claims to be considered must be sworn to by the party claiming adversely and not by the attorney. Hearings may be had to determine whether the legal expenditure has been made on the mine for which a patent is desired. The expenditure of more than \$15,000 by owners of the adjoining mine on a portion of a tunnel running through the premises embraced in the application for patents, in case the applicants were to have an interest of such tunnel, is considered an expenditure under the mining laws upon the claim applied for.

## USEFUL INFORMATION.

## Science and the Sea Serpent.

Professor Proctor, the well-known English astronomer, has an inclination toward a belief in the sea serpent which has taxed people's credulity for so long a time. In the *St. Nicholas* he writes:

I think it may interest your readers to jot down a few facts—some of which are not commonly known, I believe, while others are commonly overlooked or forgotten.

1. A great number of foolish stories have been told about the sea serpent by anonymous hoaxers; so that,

2. Persons of known name are apt to be ashamed, rather than otherwise, to describe any sea creature (or appearance) which they suppose to be the sea serpent. Yet,

3. In 1817, eleven Massachusetts witnesses of good repute gave evidence on oath before magistrates (one of whom corroborated the evidence from his own observation) about a serpentine sea creature 70 or 80 feet long, seen in some cases within a few yards. It presented all the features afterward described by the officers of the *Dredalus*.

4. In 1833, five British officers record a similar experience.

5. In 1848, the captain of a British frigate sent to the Admiralty an official description of such a creature, seen (by himself and his officers) traveling past his ship, close by, so that he "could have recognized the features" of a human person at the distance "with the naked eye."

6. Captain Harrington and his officers saw such a creature in 1858, under such circumstances that he says: "I could no more be deceived than (as a seaman) I could mistake a porpoise for a whale."

7. The story last related, marvelous though it is (rejected on that account, when first received as a probable hoax), has been deposed to on oath by all who were on board the *Pauline* at the time. The captain of the *Pauline* writes me that, instead of being anxious to tell the story, he and his officers and crew were in twenty minds to keep it to themselves, knowing that they would be exposed to ridicule and worse.

8. It is certain that creatures of the kind—i. e., not sea serpents, which few believe in, but sea saurians—were formerly numerous.

9. Of other creatures numerous at the same time occasional living specimens are still found.

10. Agassiz states that it would be in precise conformity with analogy that such an animal as the *Enaliosaur* should exist still in the American seas.

11. Of several existent sea creatures only very few specimens have ever been seen (in some cases only one). With these and like facts before us, we may believe that the above-mentioned observers were deceived and doubt whether any *Enaliosaurs* continue to exist. But there is no scientific reason for denying the possibility of their existing and being occasionally seen. The foolish stories told by hoaxers have no bearing on the case one way or another. At least, they should have no bearing with those who can reason aright.

**PAINTED ROOFS.**—S. W. Jewett, of Shepherd Home, Vt., writes to the *Argus and Patriot*: Cast your eye over any village, or country town, and you find looming up thousands of naked roofs of shingle, unprotected by a coating from the painter's brush. You can travel through the States and not find, perhaps, on your road, even one building where the shingles have been decorated and preserved by oils and paints. If outside walls are preserved and benefited, why not see to the roofs as well, and apply a suitable coat of paint to preserve, adorn and decorate the whole? I was born and have lived under roofs thoroughly painted nearly all my life, and my experience tells me that for a better system of management the roof should be the first to save and protect. If paints are immediately applied, it guards against shrinkage, warping, splitting, leakage and the gathering of fine woody down, and moss from growing to the shingles, where sparks might lodge and ignite the whole into one vast flame. Even the wearing and preserving of the roof for many years, if for no other reason, should be a sufficient inducement to add to the expense a full finish from the painter's pot.

**HORSEFLESH FOR HUMAN FOOD.**—In 1875, the horse butcheries of Paris furnished, for public consumption, 6,865 horses, asses and mules; in 1876 they furnished 9,271, giving 1,685,470 kilograms of meat meat. At Lyons, the number has diminished from 1,262 in 1875 to 1,088 in 1876. On the 1st of January there were 58 butcheries in Paris and only seven in Lyons. At its meeting, on January 9th, the committee *de la viande de cheval* awarded a silver medal to M. Petard, who has nine butcheries in Paris, as a reward for his enterprise.

**AN ENORMOUS PIECE OF COAL.**—Last week an enormous piece of coal, which we understand is intended for exhibition in London, was drawn out of the Edmunds Main colliery, near Barnsley. It measures five feet square and three feet thick, and weighs about a ton and a half, including both the hard and soft seams.

**APPLICATION OF MOTIVE POWER.**—Some important discoveries have been made by Mr. George Beesley, C. E., of Kemington, England, to whom must be given the honor of showing that when used for locomotive purposes a wheel rotates upon its periphery, and that advantage is gained by setting the cranks dead fore and aft, or at 180° from each other. The impossibility, or otherwise, of encountering a dead point with the cranks so set has been supposed by some engineers to have been already ascertained, but their mistake probably arises from their having used the wrong kind of engine. Mr. Beesley's intention appears to be to run locomotives with two separate (perhaps two on each side of the boiler) single-acting condensing engines, "as the strokes of the two engines occur alternately." Amongst the advantages of the invention Mr. Beesley claims that by its use much lighter engines than those now employed will have sufficient adhesion to draw an equal load, so that he would seem capable of entirely superseding a previous suggestion for using putty around the driving wheel tires for the same purpose. By way of appendix he gives a curious little treatise upon the application and resolution of force, which will certainly not subject him to the charge of plagiarism upon the writings of recognized mathematical authorities who have preceded him. Throughout the pamphlet there is evidence of freedom of thought seldom met with, so that it is well worth perusing.

**FORESTRY.**—Franklin B. Howe, of Lowville, Lewis county, N. Y., has been appointed, under act of Congress, to prepare a report on forest trees. He begs assistance from botanists, entomologists and others. He wants names of native timber trees in any section, accounts of cases in which after destruction of one kind of timber another has come up, accounts of experiments in forest planting, effects of climate on trees or of forests on climate, insect ravages, or other facts of interest.

**ELECTRIC SIGNALS.**—During the past year a patent electric system has been introduced on the trains of the Philadelphia, Wilmington and Baltimore railroad. This system supersedes the present bell and cord arrangement to communicate with the engineer, and also gives a continuous automatic alarm on the locomotive whenever any portion of the train becomes accidentally detached. The arrangement is also applied to freight trains.

## GOOD HEALTH.

## Vegetation and Health.

The *Popular Science Monthly* does not forget occasional articles on hygiene and kindred topics. The August number has several papers of interest to the hygienist, from which we make a few extracts. In a paper on the "Climate Influence of Vegetation," we find the following paragraphs: The exhilarating influence of a woodland excursion is not altogether due to scenic effects and imagination. Forests exhale oxygen, the life-air of flames and animal lungs, and absorb or neutralize a variety of noxious gasses. Scirrhus affections of the skin and other diseases disappear under the disinfecting influence of forest air. Dr. Brehm observes that ophthalmia and leprosy, which have become hereditary diseases, not only in the valley of the Nile, but also on the tablelands of Barca and Tripoli, are utterly unknown in the well timbered valley of Abyssinia, though the Abyssinians live more than 100 geographical miles nearer to the equator than their afflicted neighbors.

The valley of the Guadalquivir, as late as a century before the discovery of America, supported a population of 7,000,000 of probably the healthiest and happiest men of Southern Europe. Since the live-oak and chestnut groves of the surrounding hills have disappeared, this population has shrunk to a million and a quarter of sickly wretches, who depend for their sustenance on the scant produce of sandy barrens that become sandier and drier from year to year.

It would be exaggeration to say that the barrenness of a treeless country is an evil without remedy. Nature is always ready to assist in any work of regeneration, and there is no desert so void and naked that it might not be reclaimed in the course of half a century. The Khedive of Egypt has wrested land from the sand wastes, as the Hollanders win it from the sea, and by a cheaper process than the building of extensive dikes. By planting date-palms and olive trees, Egypt has added many hundred square miles to her arable surface, and, as Baka-Pasha assures us, her annual rainfall has almost doubled. Between Karnak and Soodan, the rain-gauge shows now a yearly average of sixteen inches, where nine inches was the maximum before 1820. And not only the limit of these tree plantations, but also the adjoining districts, have been benefited; on the table-land of Wady-Halfa the present temperature is not nearly as oppressive as it was within the memory of men now living, and currant bushes and wild mulberries have sprung up where they never grew before. In France, too, the government has reclaimed the *Landes*, a sandy steppe on the southwestern coast, by planting willows and bay trees; and even Algeria has been improved by the persistent tree culture of the French colonists.

## What an old Miller Thinks.

What an old miller thinks about flour, as related to health and nourishment, is worth a moment's reflection. R. Moody, of Maine, writes to the *N. Y. Tribune* as follows: On farms that have been cropped many years, and have not been supplied with enough of the proper kind of plant food to perfect the growth, wheat is much inferior in quality as well as in quantity to what it was half a century ago. Fifty-five or fifty-six years since I began flouring wheat in this place, and am now doing the same (at 72 years of age), and can see a marked decline in the condition of the grain as it is brought to the mill; but I have never seen or heard of any process by which I thought flour from any quality of wheat could be improved further than to free it from all foreign substance, and clean perfectly the exterior of the wheat; then if the wheat is perfected in growth and well cared for, it is, when well ground and bolted, fit food for man, but better if not bolted or sifted at all. I think fresh ground the best; ago will whiten the flour, but all improvement in whiteness (if it is an improvement) causes corresponding depreciation in strength. And yet the present strife among millers seems to ascertain who shall lead in making the whitest flour, and especially the whitest from the middlings. The result is that the manufacturer who makes the whitest from sound and clean grain deprives the consumer of the most life-sustaining elements. The manufacturers spend millions in improved machinery to divest the flour of its most essential parts, which the consumers have to pay twice dearly for; first, the great cost of machinery in cash; second, and most essential, the enervating condition of the physical system, which in these days, is not over-taxed with nerve-food or sunlight. But so long as the eyes of the masses are their gods, I presume they will subject both the inner and outer man to all kinds of torture for this visionary gratification.

**WHY GOLD CHANGES COLOR.**—It is well known, says the *Jeweler*, that the human body contains humors and acids, similar in action to, and having a like tendency towards, baser metals, as nitric and sulphuric acid have, viz., to tarnish and dissolve them, varying in quantity in different persons; and of which theory we have abundant proof in the effects which the wearing of jewelry produces on different persons. Thousands wear continually, without any ill effect, the cheaper class of jewelry with brass ear-wires, whilst if others wore the same article for a few days, they would be troubled with sore ears; or, in other words, the acids contained in the system would so act on the brass as to produce ill results. Instances have occurred in which articles of jewelry of any grade below 18 carat have been tarnished in a few days, merely from the above-named cause. True, these instances are not very frequent; nevertheless it is as well to know them, and they are sufficient to prove that it is not in every case the fault of the goods not wearing well—as it is generally called—but the result of the particular constitution by which they are worn.

**HOW POISONS ARE SPREAD.**—G. Owen Rees, Consulting Physician to Guy's Hospital, London, has called public attention to some unexpected sources of arsenical poisoning. The green calico lining of bed curtains has been found to have produced, for months, severe symptoms, which were treated as those of natural disease, without benefit to the patients. When the curtains were removed the patients at once recovered their health. The beautiful pale-green muslin, largely used for ladies' dresses, has been found to contain not less than 60 grains of the arsenical compound known as Scheele's green in every square yard. He suggests that, in order to prevent much of the nausea, vomiting, headache, inflammation of the eyes, etc., from which so many suffer, there be a prohibition of the manufacture of such deleterious fabrics. Red, scarlet, and mauve-colored fabrics are not always free from arsenic. He adds that the agitation of skirts in dancing discharges arsenical poison, which probably causes some of the pallor and languor almost always wholly attributed to ill-ventilated and crowded rooms and bad champagne.

**LEMONADE.**—It is not in vain that nature has given us a taste for lemon juice, and that some persons have often a craving for it; this indicates a want of the system. Ships going on long voyages now take lemon juice on board as the best antidote against scurvy, that dread of the mariner, and the result of the privation of vegetable food or fruit, for which lemon juice is a general substitute.

We notice an item of the effectiveness of lemon juice in another form of impurity of blood, of which carbuncle is a symptom and an outlet at the same time. Dr. Gibbons, having been a sufferer from carbuncle, relates his own case, in which lemon juice (for which he felt a desire) seemed to have a most beneficial effect. Wine, whiskey, tonics, and all the usual remedies, gave him no relief, and did not help digestion. As soon as he took lemon juice digestion improved, as well as the local symptoms; and the effect was such that he intends to treat his patients in the same way. We have found in other diseases lemon juice a most grateful remedy, especially where (as Dr. Gibbons mentions in his own case) there is a desire for acid drinks and vegetables.



# MINING SCIENTIFIC PRESS

W. B. EWER..... SENIOR EDITOR.

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W. B. EWER, JNO. L. BOONE.

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Address all letters to the firm, and not to individual members, or others, who may at any time be absent.

Our latest forms go to press on Thursday evening.

SAN FRANCISCO:  
Saturday Morning, August 25, 1877.

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## The Week.

Nothing of any great importance in connection with the mining interests has occurred during the past week, except the decision in the Eureka Consolidated mine case. As detailed in another column, this company brought suit against the Richmond Consolidated, an English company, on the ground that they were trespassing on the Eureka's property in following their ore. The decision is one of great importance to the mining community, as involving the question of "heds" or "lodes." The Court says, it seems, the various acts of Congress do not define the word with distinctness. The definition given of a lode by geologists is a fissure filled with mineral matter. But miners used the word before it was defined by geologists, and made the definition first. By their meaning the word "lode" means such a formation as enables them to trace the deposits which they are seeking. It seems by the definition of the Act of Congress that the legislators endeavored to avoid adhering to the definition of geologists, leaving courts free to accept the miners' definition. Our interior California exchanges do not contain much on mining matters at present, politics being the main theme discussed; so that we have no news of any great changes to report. The gravel mines are nearly all shut down, waiting for the rain; but, in the meantime, the owners are preparing their ground for work in the fall. The season has been short this year, but the time for preparation has been so long that the claims are in good order for the winter's campaign.

ANTIMONY is quoted in Liverpool at £48 to £49 per ton for French Star regulus.

## Mistakes and Failures in Coal Mining.

There have been on this coast not a few failures in mining for the precious metals, and the mistakes made before, and even after, experience was gained, have been numberless; but these mistakes and failures have also extended to the coal mines, where the experience of others should have served as guides. At Coos Bay, for instance, where the most extended coal fields on the coast exist, there has been a wasteful expenditure of money by thoroughly incompetent, if not in some cases dishonest parties, in searching and mining for coal. Mr. W. A. Goodyear, in his recent work on the coal mines of the western coast, says that it would not exceed the truth to assert that, since 1870, there has been expended in this way an aggregate sum of not less than half a million dollars; every dollar of which is a total loss, and at least nine-tenths of which would certainly have been saved if the advice of a competent engineer had been sought and followed.

As it has been a time-honored practice, among the gold and silver miners of California and elsewhere, to erect a costly mill with all its appurtenances for crushing, amalgamating, etc., before the mine was sufficiently developed to prove whether there was anything in it worth crushing or not, so the usual practice in Coos Bay has been to build railroads, wharves and bunkers before any coal worth mining was found; and, in more instances than one, under circumstances where there never was any reasonable probability that any coal would be found which would pay to mine.

Mr. Goodyear, in the work alluded to, instances several of these failures. In the Hardy mine, a tunnel and gangway, with a view to furnishing them with double tracks, were foolishly driven twice their necessary size; a bunker was built at the mine capable of holding 1,000 tons of coal; a railroad was built, 3,700 feet in length, from this bunker to the landing, and at the landing a high and costly wharf was also built. And all this on a mine, where, although the croppings looked well enough, the coal below was soft, and crumbled badly on exposure. The bed itself was rolling and irregular, and the roof soft and weak. It is believed that over \$150,000 were sunk in this excitement. It is certain that a large sum was expended on outside improvements and works, of a character which contributed nothing towards proving the real value of the mine, and which themselves possessed no value as soon as the mine proved worthless.

A large sum of money was also spent on the Utter mine, where bunkers were erected, and a railroad, wharves, etc., built, although the location was such that the cost of transporting coal to the navigable water prevented successful competition with mines more favorably situated. The North Pacific Coal Company's property also cost considerable money, but to which the cost of transportation was fatal from the beginning.

The most conspicuous and inexcusable mistake detailed by Mr. Goodyear was that involved in the opening of the Hardyville mine; and it would be difficult to find in the annals of coal mining anywhere an instance of grosser ignorance and incapacity, combined with more reckless folly, than was displayed here. The locality is on the right bank of Isthmus slough, some three miles above Coos City, and at about the head of any practicable navigation on the slough. It is close to the water's edge, and the situation would have been good enough if a mine had existed there. But there was never any reasonable evidence of any probability of the existence at this property of a pound of coal which would pay to mine. There is, however, a heavy bed, some seven or eight feet thick, of alternating layers of clay slate "bone" and other worthless material, including some soft and dirty coal, which strikes about north and south and dips to the east. Upon this bed a slope was started down—not in the direction of the slope of the bed, which, as just stated, would have been about east—but obliquely to it, with a course of about N. 53° E. This slope was continued down in this direction, following approximately the general course of the plane of the bed, through faults and disturbances of various kinds, and with an average pitch of about ten or twelve degrees, for a distance of some twelve hundred feet, without any visible improvement whatever in the character of the materials which constitute the bed, and with no other result than that of demonstrating the fact that this bed, worthless as it is anyhow, is also considerably broken by faults and other disturbances. This was the mine; but this was not all. A pair of costly and very handsomely finished steam engines—said to have been originally built for use in the Palace Hotel in this city—were purchased and set up and erected there for hoisting engines. Boilers, pumps, etc., were supplied, of course, and a small town was built. A bunker was erected on piles in the water near the middle of Isthmus slough, capable of holding nearly 1,000 tons of coal. A track from the mine to the top of the bunker was laid over a trestle work, also on piles, some 900 feet in length, and about 50 feet above high water in the slough. No screens were furnished either at the mine or at the bunker, it being asserted that "this coal was of such superior quality that it needed no screening, the fine being as good as the coarse." Moreover, the bunker itself was divided in its interior by

vertical cross-partitions running from top to bottom, with ten separate compartments. This was for the purpose of keeping separate from each other as many different qualities of "superior" coal, all of which, it was expected, would be obtained from this same utterly worthless bed. On the same property, in another locality, considerable money was spent in sinking a slope 500 feet in a place where there was abundant evidence on the surface that the rocks were badly crushed and broken, as they were found to be in the slope itself.

It is stated on good authority that the amount of money spent on this Hardyville property alone considerably exceeds \$200,000. Nearly the whole is a dead loss, and one that would never have happened if any competent person had been sent to examine the mine in the first place.

## Foundry Notes.

Work at the various foundries and machine shops continues slack, and times are dull with them as with other branches of business, at present. There is, of course, the usual amount of small work going on, but there are few large mining orders in the shops.

### The Golden State and Miners' Iron Works.

The Golden State Iron Works and Miners' Foundry have joined forces under the above name, and formed an incorporated company, with the following Directors: Cyrus Palmer, H. B. Angell, W. L. Palmer, I. W. Knox and R. F. Knox. The lease of the Golden State on its old premises having expired, the ground was bought by Huntington, Hopkins & Co.; so they were compelled to move after being in the same location for upwards of 15 years. An arrangement was then made with the old Miners' Foundry, to form a joint company, and concentrate the business of both shops in one location. The machinery, etc., of the Golden State has been nearly all moved to the Miners', on Front street, near Folsom. At these premises there are four water lots, and, in the rear, two forty-foot square lots. The buildings are being enlarged and improved, to make them more convenient, and allow the managers to do any kind of work. The tools of the Golden State are all as good as any, but they had no large lathes or planers to admit of heavy work; but now, with the tools of both foundries, the new company will be able to undertake any job without having to send part of the work outside. The Golden State, which was originally the Sutter Foundry, is among our oldest shops, and the Miners' was also established a good many years ago. The combination will be of advantage to both parties, as their facilities will be increased greatly, and they will now be able to do any class of work.

### At the Pacific Iron Works

They have nearly completed the machinery for a large and powerful steam tug for Adams & Taylor. The engines are compound, and the machinery will be complete to put in the boat. The large cylinder is 34 inches, and the small 20 inches, by two-foot stroke. They are also compounding the engines of the steam tug *Brennan*, fitting surface condenser, etc. A 12-inch engine and hoiler are being made to go to Mexico for a mine, and a 10-stamp battery is being built for the same destination. The machinery is being built in sections for packing over the mountains. These works are engaged in the construction of a large sugar mill, with 12-inch rolls, vacuum pan and engine, to go to the Sandwich Islands. This is the largest sugar mill ever built on this coast, and is on the plan of the large Eastern mills. They have just completed a new style of revolving quicksilver furnace, which is being set up at the mine at Steamboat Springs, Nevada. It is called Thompson's improved rotary quicksilver furnace, and is something like the White, changed to be adapted to the working of the ores of mercury.

The Pacific Iron Works have made arrangements to manufacture the celebrated Walker compound steam pump, recently described and illustrated in the MINING AND SCIENTIFIC PRESS. Messrs. Parke & Lacy are still agents for the sale of the pump, but these works will manufacture them on this coast instead of having them shipped here. They are coming into great favor as a mining pump.

The Pacific is putting up a 20-stamp mill and hoisting works for the Star company, at Cherry creek, engine and all complete, with two Howell rotary furnaces. Two of these furnaces are also being made for the Grand Prize mine.

### The Howell Rotary Furnace

Is a new design, somewhat on the general plan of the White, with some new principles. It has been tested for some time on the Comanche and Indian Queen mines, at Benton, Mono county, and found to be very successful. It is patented by John Howell, of Benton, and is intended for chloridizing silver ores and desulfurizing copper, gold, lead and zinc ores. The revolving tube is arranged on carrying wheels with one end opening into the upper furnace chamber, and the other into a lower furnace into which the ore is discharged from the tube after treatment in it. The tube is made in sections, having flanges, the upper section being smaller than the lower ones and connected by middle sections of intermediate sizes.

The tube is arranged to descend a little from the upper to the lower end, and contains three spiral flanges to urge the ore along from the upper to the lower end. One of the carrying wheels is toothed to turn the tube. The carrying wheels, on which the upper end of the tube rests, are on bearings which are capable of sliding toward and from each other, to raise or lower the tube, to adjust its inclination; and the plates surrounding the tubes at the openings into the furnace are adjusted to allow the tube to be properly placed. Beside the furnace for generating the heat at the lower end of the tube, there is a furnace at the upper end for generating heat for chloridizing such fine particles of ore as may be carried out of the furnace by the draft before being sufficiently chloridized; the heat from said furnace being discharged into chambers for that purpose, along with the heat from the tube, and passing therefrom into another chamber for thoroughly doing the work before escaping into the air. In the furnace being made at these works the cylinder is reduced from 40 to 31 inches. It is claimed to be a great improvement in this class of mining machinery.

## Mine Management.

Sometimes, when one thinks of the abuses which have occurred and the money which has been wasted or misappropriated by managers of companies, it looks as if our system of incorporations was all wrong and should be abolished for this reason alone. With one, two, or half a dozen men having supreme control of the accumulated money of a thousand others, and the direction of disbursements, purchases, etc., it is little wonder that we hear of so many abuses; more especially when it is remembered that men are often put into such responsible positions without any of the necessary qualifications, except shrewdness and a willingness to further the interests of the individuals to whom they owe their places.

In our mining companies these irregularities are more frequent than pleasant, and have done more to injure the mining interests of the country than any other thing; and we think, with the *Gold Hill News*, that the searching investigations which have been recently made into the management of some of the mines and the measures taken to reform discovered "crookedness" and mismanagement have exercised a good influence. At any rate, the effect of these investigations and reforms cannot fail to be highly beneficial, and they should be extended to every mine along the great lode. When stockholders can see and know better where their money goes to, and that it is not being stolen, squandered or otherwise misappropriated, then, and not till then, can they feel a return of confidence, and a greater willingness to invest their money or pay their assessments. The reform in Ophir was most certainly a good one, and the changes in both that mine and the Savage were decidedly judicious and beneficial. Some other companies are instituting reforms in the matter of salaries, and cutting down all unnecessary expenditures. These reforms will call for less assessments, a gratifying point to stockholders. Because there happen to be \$30,000 or \$40,000 in the company's safes resulting from the levying of assessments, there is no reason in a Superintendent studying out means to open it in all sorts of ways. The development and prospecting of the mine, which should be the first consideration, is too often the last; and then men in charge take advantage of these positions and get commissions here and there and everywhere, all of which in the end come out of the company. And this in the face of the fact that Superintendents generally have very good salaries and comparatively easy positions. Of course all are not alike, and it is fortunate they are not; but recent events have proven that some of those longest at the business were not so trustworthy as was imagined.

These things exercise a very hurtful influence on mining matters. If people are called upon to pay assessments upon their stock they like to feel that it is for actual development of the mine. If they have any impression that their money is doing more to enrich a Superintendent than themselves, they naturally hesitate about paying. Several investigations which have occurred this year have proven that "irregularities"—to use a mild term—are more common than was supposed, as scarcely one of the investigations failed to show up transactions which in any other kind of business would have made an outcast of the perpetrator. The more thoroughly the mining interests can be purged of the class of men referred to, the better will it be, and we are glad to see that the public is opening its eyes to the evils in a manner which shows some earnestness of desire to break them up.

ENTRIES AT THE FAIR.—We give in this issue a complete list of entries to date, at the Mechanics' Institute fair, so that our readers in the interior may have some idea of the variety of articles exhibited. New exhibits are continually being made, so that all the available space is pretty well filled. The fair is in every way a success, both financially and otherwise, and is daily and nightly visited by thousands.



## An Important Mining Decision.

On Monday a decision was rendered, in the United States Circuit Court, in favor of the plaintiff in the celebrated case of the Eureka Consolidated vs. Richmond. This important case has been on trial for some time past, during which time a large number of experts were examined, and their testimony, when printed, will make a book as large as any one on geology yet published. The opinions, however, will be more diversified than is usual in such cases, and some of the statements made are entirely original, never having appeared in any work on geology, mining, or any anything else.

The action was in the nature of an ejectment, and suit was brought in the United States Circuit Court by the Eureka Consolidated to perfect title, the Eureka claiming that the Richmond Consolidated company was trespassing on their ground. The Eureka Consolidated—the plaintiff in the case—held that their ore body was continuous, while the Richmond set up a theory that they were working on a pipe vein which they could follow indefinitely, even though it penetrated the patented lines of the plaintiff. The Eureka Consolidated claimed that the famous Pott's chamber, this great ore body from which the Richmond has taken a vast amount of bullion, was really the property of the Eureka; but the Richmond held that this was a portion of their pipe vein. The defendant claimed the right to follow the vein or ore cropping on their ground as far as they pleased, irrespective of the patent covering the adjoining ground.

The value of the ground contended for was between two and three million dollars, and the trial was conducted by some of the best mining lawyers on the coast. The suit was originally brought in Nevada, but was transferred to this city by agreement. The counsel for the plaintiff embraced Solomon Hydenfeldt, Garber & Thornton, R. S. Messick and H. K. Mitchell; and for the defense, Wren & Thornton, S. M. Wilson, Williams & Thornton and Messrs. Hillhouse and Lansing. The representatives of the two corporations were General George S. Dodge, President of the Eureka Consolidated, and Mr. Prohart, Managing Director for the Richmond Consolidated mining company.

The decision read by Mr. Justice Field was a long and carefully studied document, in which the rival claims were closely scrutinized, the result being that all points in the controversy were settled in favor of the Eureka Consolidated company. The defense had claimed that the Act of 1866 allowed the locator to follow a vein into the adjoining land; but the miners, for whom this Act was framed, meant that the locator could follow a vein to the extent of the number of feet on the surface, else he might oust all his neighbors and take the entire ledge. This construction of mining rules is given in every mining district. This patent does not authorize a patentee to go outside of the surface lines. The line on the side of the claim, and not the line on the end, may be taken. The line taken does not measure the extent of the miner's right, as carving out a section of the lode beyond which he cannot pass. The diagram of a location must embrace more than lineal measurement. The Act of 1872 allows a locator the dips, angles and spurs of a vein cropping on his location, but not beyond the limits defined by the Act of 1866.

The opinion concludes as follows: "Our opinion, therefore, is that both the defendant and the plaintiff, by virtue of their respective patents, whether issued upon locations under the act of 1866, or under this act of 1872, could only follow the veins or lodes lying within lines drawn vertically downward at the end of the respective locations, and that each take the ores found in all veins and lodes the apex or top of which lay within these lines. The same conclusion would be reached if we looked only to the agreement of the parties made the 16th of June, 1873. Our finding is, therefore, for the plaintiff, and judgment must be entered thereon in its favor for the possession of the premises in controversy."

Signed, Field, Presiding Justice; Sawyer, Circuit Judge.

Justice Field stated that Judge Hillyar, of the Nevada Circuit, concurred in the opinion.

Counsel for the Richmond mine asked a stay of proceedings for 20 days, and also for special findings.

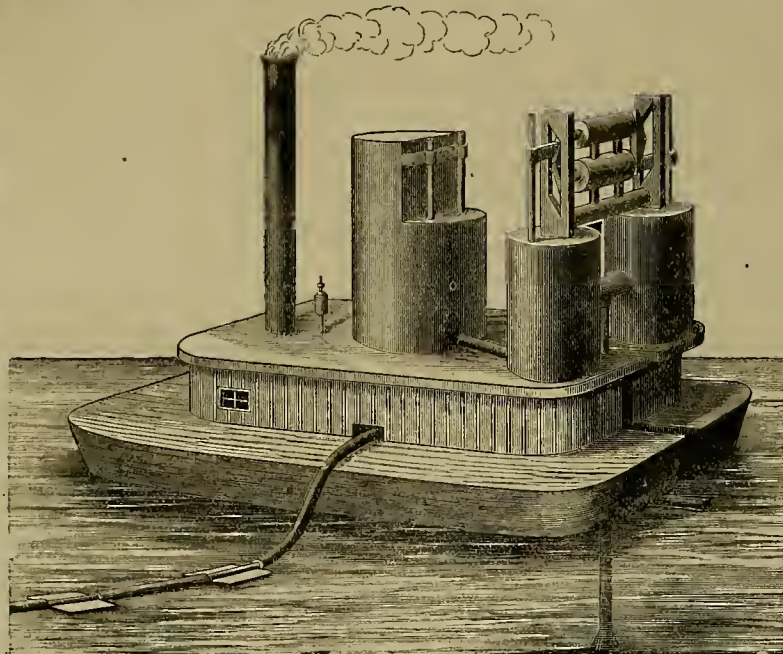
Mr. Justice Field objected to the latter request on the ground that the Court had already been overworked in the case, and he therefore desired counsel to prepare the findings.

As a result of the decision, it is stated that the Eureka Consolidated will immediately sue the Richmond for damages in the sum of \$2,500,000; but it seems pretty tough on the English company to lose the property in dispute and have to pay out a sum also for ore taken out. The decision, however just, will act to the detriment of the mining interests of this coast, as far as English capital is concerned, for the English company will hardly feel satisfied with the result, and will lay it to prejudice more than to law. They have very little confidence as it is, and this reverse will hardly be accepted with equanimity by those who have invested so heavily and lost. Of course, in a court of law, no such considerations would have the slightest weight, but it will be difficult to make our English cousins believe it.

At Eureka there was great rejoicing on receipt of the news of the verdict. The Eureka Consolidated's whistles screamed for an hour; miners and citizens grew enthusiastic, and for a time a large portion of the population was given over to demonstrations of approval. The friends of the Richmond were, of course, correspondingly depressed. One of the immediate effects of the decision will be the starting of two more furnaces by the Eureka Consolidated, and the employment of an increased number of men in the mine. As the town has been full of unemployed men waiting for the decision, it has given many of them work, which they sadly needed.

## Dennison's "Ingurgitator" Dredge.

This dredging machine, as its name indicates, is constructed on the suction principle. It raises the material from the bottom of a river, lake or bay, and conveys it to any distant point either over land or water. As a levee builder it is unexcelled. It has long been known that mud taken from the bottom of a river will make an embankment of peculiar strength when once it has settled and dried, and not easily destroyed by overflow of water. This machine takes advantage of this fact and works to double purpose, by deepening the channel and procuring the best material for a levee at the same operation. It mainly consists of two steam vacuum pumps provided with suitable telescope suction pipes, extending to the bottom of the water, through which the mud is raised by a vacuum produced by filling the cylinders with steam



DENNISON'S "INGURGITATOR" DREDGE.

and then condensing it. The mud is forced from the cylinders into a pressure tank, and from there forced through pipes to the discharging point.

This machine has been in operation at Union Island, San Joaquin river for near six months, raising a thousand cubic yards per day with a three foot cylinder. It is to be put to mining in some of our river beds also, as this new system of mining is becoming quite popular in the upper rivers. We may soon expect to see the suction tubes feeling their way over the beds of our gold bearing rivers, searching for the precious metals like an elephant's trunk hunting for a pin in a bucket of water, and on the same principle.

Persons desiring to examine this machine can see it in operation at the above named place, or plans of it can be seen at the office of David Jennings, Fireman's Fund building, corner of Sansome and California streets.

**THE LICK ESTATE.**—The action instituted by Richard S. Floyd and the rest of the Lick Trustees against John H. Lick, administrator, having for its object the judicial sanction of the compromise by which the Lick heirs are to be paid \$385,000, in addition to the original bequest, came up in the Nineteenth District Court on Saturday, and is still occupying the attention of that Court. All the heirs and beneficiaries accepted the compromise, by which the additional sum is to be deducted from the residue of the estate, except the California Academy of Sciences, which organization demands that this additional sum shall be deducted pro rata from each legatee. The latter party filed a demurrer to the complaint, setting up that the Court has no jurisdiction of the subject of the action; that the plaintiffs have not legal capacity to sue; that there is a defect of the parties defendant, in that John H. Lick in his individual capacity is not made a party defendant, and that the complaint does not state facts sufficient to constitute a cause of action.

LEAD is selling in Liverpool at £20 to £20 7s 6d per ton for good ordinary brands.

## The Iron Steam Launch.

The little iron steam launch in the machinery department of the pavilion, exhibited by Hall & Kelshaw of the Sacramento Boiler Works, on Fremont street, attracts considerable attention and comment. It is the first one of the kind ever built on this coast, and was put up to show what could be done here in this line.

The launch is 28 feet over all on deck and 25 feet keel. She is five feet four inches beam and three feet deep. The keel plates are of No. 14 and the rest of the shell of No. 16 iron. The angle iron is inch by inch by one-eighth. The beams are inch and a half by inch and a half by one quarter. A water tight compartment is constructed across four feet six inches from forward. This answers a double purpose. It is intended to carry the supply of fresh water for the boilers, and in case the launch gets stove forward she will not sink.

The little vessel is not entirely completed. The forward and after end ends are left open so that the construction can be examined, and people can see the method of iron ship building. She will have an iron floor from the bulkhead to within four feet of the stern, for the engine and boiler to rest on. The boiler and engines are in process of construction and if completed before the fair closes will be placed in position for exhibition. All the frames in the launch are tied with angle iron and plate from a nine-inch level. The rivets are three-sixteenths in the shell and one-quarter inch in the angle iron. The builders of this launch have had consid-

## Comparative Values.

Whenever anybody strikes a prospect in any of the silver-mining districts on this coast, now-a-days, and finds a few tons of ore, it invariably corresponds in appearance with the bonanza ore, only it is considerably richer. Comparisons are then entered into, which make the bonanza appear small and insignificant beside the new "find." And the figures look so satisfactory that the sanguine proprietor sometimes succeeds in forcing his belief on credulous friends, who, on a slight investment, have visions of fabulous wealth, compared with which the riches of the bonanza kings are small indeed. They seldom think of the years of toil, uncertainty and doubt, and the enormous expense of prospecting entailed in opening and developing a first-class mine, any more than they do that the chances of finding such a body of ore, in an ordinary mine, as exists in the Consolidated Virginia and California mines, is about a thousand to one. People are not only fooled once, but half a dozen times under just such circumstances, and still the thing continues.

We are led to these remarks by the sanguine statements of the Colorado Springs Gazette, with respect to the stocks of some of the San Juan mines. It says that stock has been issued and placed upon the market in many instances, and commands such a low figure as to excite ridicule. In most cases the mines of these corporations are known to be rich, and the only reason generally assigned for the extremely low price is the large amount issued. In our opinion this is a very good reason indeed, as has been proven in our experience in the San Francisco stock market. When stocks are cut up and divided into many thousands or hundred thousand shares, they cannot be sold for the price they would if in smaller parcels. This used to be the case, and is one of the reasons why our stocks have been divided to so great an extent. The game is played out, however, as a glance at the prices of stocks in San Francisco will show. The bonanza mines are exceptional in every respect, and do not offer a fair basis of comparison.

Still our cotemporary goes on as follows, comparing the San Juan stocks with the famous bonanzas: "The celebrated Consolidated Virginia claim was originally 1,310 feet in length, and, as organized, issued 11,600 shares, of \$50 each, and the lowest price they ever brought was two cents on the dollar, which would make an aggregate of \$11,600. The present length is 710 feet; the number of shares has been increased to 540,000, which are quoted at from \$43 to \$46 per share, which would make the present value of the mine, together with the California (600 feet), which was stricken off, between \$46,000,000 and \$47,000,000. Here we have the San Juan Consolidated mining company, 20,000 shares, of \$100 each, selling at from two to three cents on the dollar; the Graham silver mining company, with about the same amount of stock, and commanding about the same price, and several others that we might mention. These prices are far in advance of what the Consolidated Virginia brought in its youthful days, and this shows conclusively that some of the San Juan mines have a good name already."

After the latter statement we do not see what the Gazette has to complain of in thinking the mines of San Juan are selling at ridiculously low figures compared with their value. Is, perhaps, not aware that it is the general custom here to incorporate with \$5,000,000 stock in 100,000 shares and then sell the shares at "bed-rock," for 25 cents to a dollar each; and many consider themselves lucky to get this. Two or three cents on a dollar is not so bad after all, when it is recollected how easy it is to make paper values and how hard to realize cash on such a basis. Scarcely a day passes that one or more companies do not incorporate with "capital" of from \$5,000,000 to \$10,000,000, when the incorporators have not got a \$20 piece in their pockets. If the stock is worth on paper \$100 per share, they will be glad to take 25 cents a share "to prospect with and form a working capital."

These things are so well understood here among mining men that it is scarcely worth while to go into details, and we only mention them to endeavor to persuade people from deceiving themselves with speculations which promise more than the bonanzas. The mines who have earned this title are notable exceptions in the history of mining, and by no means serve as fair examples on which to base comparisons. People who do this deceive themselves, or try to do so, and the longer it is continued the more harm will result.

The deepest point yet attained in the practical workings of any mine on the Comstock, regardless of topographical undulations or inequalities at the surface, is in the Yellow Jacket mine. The 2200-foot level, where all the prospecting and development work of the mine at present is being done, is 775 feet below the level of the Sutro tunnel, or 170 feet below the level of the lowest workings of the Imperial mine, which shows the deepest workings of any mine on the lode. It must be borne in mind, however, that the surface or top of the Imperial shaft is two hundred feet higher than the Yellow Jacket.

L. STRONG, Assistant State Geologist of Wisconsin, was drowned in the Flambeau river, Saturday, while engaged in his geological investigations.



Continued from page 118.

- 445.\* Wiester & Co: powdered toilet soap.  
 446.\* W H Burton: window awnings.  
 447.\* Pacific Rubber Paint Co: rubber paint.  
 448.\* Boca Brewing Co: beer.  
 449.\* Mrs W H Burton: bird cage awning (patent).  
 450.\* Giant powder Co: Giant Co's competition grades, 1, 2, Ex, and 2 Judson.  
 451.\* James Dexter: bon-bons, cake ornaments.  
 452.\* G Rotanzi: bitters, "Long Life."  
 453.\* Carl Eisenschimmel: drawings and writings.  
 454.\* Joseph Brothers: clothing, youths' and boys.  
 455.\* Weed & Kingwell: brass goods—bells, church and gong, steam brass work, plumbers' brass work, Eureka lubricators, miscellaneous brass work.  
 456.\* Wiester & Co: coal oil stove, "Summer Queen," "Complete" washing machine.  
 457.\* California Paint Co: Averil mixed paints.  
 458.\* California Spring Bed and Mattress Co: Crandall spring bed, Lanes patent wool mattress and pillow, hair mattress and pillow.  
 459.\* W F Sherwin: press, punches and dies for button fastener.  
 460.\* C T Merwedel: mechanics tools, foot lathes, California make, and Eastern moulders' tools, and Fleet wood scroll saws.  
 461.\* California Spring Manufacturing Co: bed and furniture springs, double spiral spring and self-fastening bed spring.  
 462.\* Larkin & Co: huggies, sulky, skeleton wagon, phaeton, Surrey wagon on elliptic spring, and do side bars, 2 men side bar huggies, 1 man do, elliptic spring piano box open huggy, elliptic spring piano box top huggy, and rockaway.  
 463.\* Luchsinger & Son: display of furniture, sideboard, bedroom sets, office desk, specimen of wood carving on the sideboard, parlor table and cabinet.  
 464.\* Vanderslice & Co: solid silverware.  
 465.\* Eureka patent carpenter gauge.  
 466.\* H F Rocky: printing presses.  
 467.\* P Beamish: white shirts and gents furnishing goods.  
 468.\* Lancaster & Northon: merchant tailor goods, pants, vests and coats.  
 469.\* Hunter Bros: varnishes and wax sheet.  
 470.\* W W Montague & Co: Van family ranges, Montague French ranges, Eureka portable ranges, metallic refrigerator, marbled iron mantels, granite iron ware, polished copper ware, japanned ware, fine steel fire sets and stands.  
 471.\* A S Hallidie: wire goods—galvanized telegraph annealed fence wire, coppered wire, tin do annealed, Staples' module of ropeway and pulley, submarine cable, and Holloway's fire extinguishers.  
 472.\* S. F. Gas Co: ammonia, commercial preparation.  
 473.\* Detrick & Co: awnings, tents and bags, overhead machine sewing.  
 474.\* S. F. Plating Co: plating and replated ware.  
 475.\* Price Press Co: excavator, hay press.  
 476.\* A G Nye: sea ferns, and sea moss album.  
 477.\* Schultz & Fisher: solid silver ware, home manufacture.  
 478.\* Holbrook, Merrill & Co: ranges—Miller, Bismark, Medallion, Model range, stoves, new Bismark, improved Buck, new Aldine parlor cook, fire side, copper-japanned ware, tin, granite, agate.  
 479.\* Hamilton & Learned: chairs.  
 480.\* Spence & Co: oil stoves and fixtures.  
 481.\* J W Ruves: entrail cord and belting.  
 482.\* Williams & House: vent top, patent fruit can sealer, top cement or wax for glass or earthenware.  
 483.\* Norcross & Co: flags, regalia, embroidery.  
 484.\* Kimball Manufacturing Co: carriages, Imperial coach, 1 and 2 horse, Charahance rockaway, top 2 seat phaeton, 1 do do, top huggies, open huggies, 1 6-seat carriage.  
 485.\* Potrero Curled Hair and Cocoa Fibre Co: cocoa fibre.  
 486.\* Kohler, Chase & Co: piano and musical instruments and drums, Fisher upright piano, Decker Bros, Emerson's and Mason & Hamlin organs.  
 487.\* P Kelly: hoots and shoes, men's, ladies, and children's.  
 488.\* M Davidson: Allen Spring mineral water.  
 489.\* G T Walton: fancy Turkish dress.  
 490.\* C P Bailey: huggy robe and mat.  
 491.\* Golden & Copson: brooms and broom corn.  
 492.\* H P Flint: glass case of California wood.  
 493.\* Dr J E Fraser: Nevada sulphur samples.  
 494.\* S F Produce Exchange: wheat, flour and barley samples.  
 495.\* W H Baxter: Metropolitan roofing and miniature houses.  
 496.\* A H Southwick: turbine windmill.  
 497.\* Power Ongh: one hook case.  
 498.\* J B Stetson: Norman ranges, tinned, copper, granite and Japanned ware, iron tank, Black Diamond and Bellingham hay coal.  
 499.\* John Roach: model of quicksilver furnace.  
 500.\* John Roach: mathematical instruments, solar compasses, surveyors', miners' and engineers' transits, mountain barometer, pedometer, pocket compasses, telescopes.  
 501.\* Miss E. L. Tripp: wax flowers.  
 502.\* Sadler & Borrowes: Victor sewing machines.  
 503.\* R F Osborn: coffin trimmings.  
 504.\* S Foster & Co: condensed eggs.  
 505.\* Peterson & Olsson: emblematic signs and models.  
 506.\* J W & W Cook: pressed salmon.  
 507.\* Johnston, Clarke & Co: Hall treadle.  
 508.\* West Coast Furniture Co: haskets.  
 509.\* Heald's Business College: telegraph office and instruments.  
 510.\* Forty-two specimens of plain and ornamental penmanship and drawing.  
 511.\* G S Thompson: soda fountain and water.  
 512.\* Ridgeway & Jansen: spring mattresses, "Clipper" and common, bolsters, first and second class.  
 513.\* Tuehner & Hoffman: show cases.  
 514.\* D Jacard: one show case of fancy candy.  
 515.\* Wm Rennie: three Boynton's tile stoves.  
 516.\* Mrs D T Phelps: one frame containing a paper named "The Mirror of the Fair," published in 1857, on silk.  
 517.\* E P Danforth: specimens of prepared leather, harnesses, etc.  
 518.\* Mrs Kelsey: one bed quilt.  
 522.\* Miss A Jones: one piece of lace work.  
 523.\* H A Chavlin: assorted cordials.  
 524.\* F B Taylor: sapolio and hand sapolio.  
 525.\* California Tar Oil Works Co: samples of oils.  
 526.\* J D Voerner: cooper work.  
 527.\* J H Culver: one cottage bee hive.  
 528.\* J Pettet: wax work.  
 529.\* Mrs W P Rutherford: shoulder brace, abdominal supporter, health corset, collection of handbags, skirt supporter.  
 529.\* Mrs H Cantel: display of lace curtains which have been cleaned and mended.  
 580.\* W H Campbell: 5 fern trees.  
 581.\* A L Bancroft & Co: 3 church pews, 1 health lift, display of school furniture.  
 582.\* F Midon: 1 case containing specimens of fancy candies.  
 583.\* Miss Carrie L Wood: 1 show case of millinery.  
 584.\* N Weston: one frame of silk work done by hand.  
 585.\* J Lachman: six bbls of chicory.  
 586.\* J G Montenegro: three oil paintings, one crayon, one drawing.  
 587.\* Lily Ransom: two colored ink pictures and frames.  
 588.\* Will & Finck: samples of hell working and electric annunciators.  
 589.\* M Weston: display of patent photographs.  
 590.\* Miss Balkun: 1 oil painting.  
 591.\* M G A Wilkins: specimens of wools.  
 592.\* T L Davidson: 1 frame containing specimens of wool.  
 593.\* Jas Hamilton: specimens on cards of wool.  
 594.\* C W T Herren: specimens on cards of wool.  
 595.\* Clackamas Packing Co: 2 cans of fresh cherries.  
 596.\* W J Kinney: 12 cases of Kinney's roast beef, 4 cases of salmon.  
 597.\* J H Foster: 2 sacks magnolia mills flour.  
 601.\* Mrs M H Batson: log cabin hed-quilt.  
 602.\* W J Cuthbertson: 1 architectural drawing.  
 603.\* S A Kusel: display of shirts.  
 604.\* Mrs C J Harper: 6 pieces lace work, 2 tidies.  
 605.\* Low & Chartrey: 1 steam washing machine.  
 606.\* Synovial Oil Agency: 3 glass jars oil, 2 tin cans and 4 dozen bottles sample oil.  
 607.\* F M Gilbert: 1 oil painting.  
 608.\* Mrs A Boaman: 1 braided mat and 2 spreads.  
 609.\* Madam Mourgeanna: 1 embossed work in frames, 2 oil pictures, display of toilet and fancy articles.  
 610.\* Mrs Sarah King: 4 pieces worsted work.  
 611.\* Wm Andrews: 1 case fancy woodwork.  
 612.\* W H Campbell: 3 Aberdeen red granite monuments.  
 613.\* E Rahjohn: display of Australian war weapons.  
 614.\* T J Rahjohn: 1 crayon picture.  
 615.\* Mrs Wm Derby: 1 worsted work picture.  
 616.\* Mrs M Durdal: 1 pencil drawing.  
 617.\* Mrs Annette Jones: 1 basket wax flowers.  
 618.\* Mrs E J King: 2 quilts.  
 619.\* Miss Rydhger: 1 case wax flowers.  
 620.\* Madam Anna Getz Lucas: 1 frame autumn leaves, 7 cases preserved flowers, 1 case natural dried flowers, 1 case colored dried flowers, 2 cases preserved dried flowers without wax, 1 basket colored flowers.  
 621.\* Mrs MacHenry: 1 oil painting, 2 panel paintings.  
 622.\* J W Cherry: 1 glass sign.  
 623.\* Robert White: 1 architectural drawing.  
 624.\* Ward Battles: 1 mechanical drawing.  
 625.\* Wolfe & Son: 9 architectural drawings.  
 626.\* Mrs Sonnichson: 1 pair pillow shams, 3 beaded curtain ornaments, 1 beaded sofa cushion.  
 627.\* Wm McDowell: 6 show cards.  
 628.\* Maria M Langrehr: 1 glass case artificial flowers.  
 629.\* Miss Jennie Clark: 2 oil paintings.  
 630.\* Henry Bailey: 10 bundles various colored hair rope, 4 bundles do, open, 4 sample bundles do, small.  
 631.\* Pacific Press, Oakland: 2 frames specimen job printing, 2 frames specimen book lists, 1 form music type, display of books and tracts.  
 632.\* Mrs J K Shafer: 1 bed-quilt.  
 633.\* Mrs Earl Bartlett: 1 knitted rug.  
 634.\* Johnson & Schule: 1 glass case harness ornaments, 2 small do.  
 635.\* Woodward's Gardens: large case of natural history specimens.  
 636.\* D Lindenhorn: 6 oil paintings.  
 637.\* Mrs M Gilhert: 1 quilt.  
 638.\* H Lake & Co: 6 cases patent shoe hacking.  
 639.\* D S Hutchinson: 1 case mechanical dentistry.  
 640.\* L Sweet: 1 clothes drier.  
 641.\* J Chessman: 1 metalline pulley block.  
 642.\* Blackmar & Davis: 1 model tuning apparatus for tuning pianos, etc.  
 643.\* G S Dickey: 4 packages of Creme de Lis.  
 644.\* T B Compton: 1000 boxes "Unrivalled Button Fasteners."  
 645.\* Mrs A Mangelberg: 1 framed piece of embroidery, 2 framed pieces needle work.  
 646.\* J Borie: 1000 patent hollow bricks.  
 647.\* Mrs F Lethy: 3 leather brackets, 1 leather basket.  
 648.\* Roby & Bruce: 1 case specimens granite.  
 649.\* E L Hall, Oakland: 6 pieces rustic work.  
 650.\* Hartman & Freese: 3 oscillating swings.  
 651.\* N S Coon: 1 glass case Hoyt's German Cologne, Main Leaf Catarrh Remedy.  
 652.\* Cassie L Sweeney: 1 frame samples of tatting.  
 653.\* Mrs Kruger: 1 frame crocheted work.  
 654.\* Mrs Jos Sedgely: 2 glass cases wax flowers, 2 pieces embroidery.  
 655.\* Johnson, Clark & Co: 8 sewing machines, 2 stands for do, 2 hand do.  
 656.\* S Simonds: 1 bottle Nabob rye, 1 bottle Bourbon whisky, 1 case whisky.  
 657.\* C Leonard: samples rope moulding.  
 658.\* Mrs Nevins: 1 pine leaf hat.  
 659.\* J E Gordou: 1 chain forge and tools.  
 660.\* J P Hopkins & Co: 7 Powlett's patent atmospheric copying presses.  
 661.\* H Trost: 1 horizontal stationary engine.  
 662.\* Mrs A McCluskey: 1 piece crocheted work.  
 663.\* Mrs Koerner: 7 frames embroidery work.  
 664.\* Mrs M Y Wether: 1 piece embroidery work.  
 665.\* Chas Peters: 1 sail boat.  
 666.\* Main & Winchester: display of harness, saddles, bridles, robes, etc.  
 667.\* Mrs J W Souther: 4 crocheted tidies, 1 do spread.  
 668.\* Mrs M Elliott: display of decalcomania work.  
 669.\* H Hickett: 14 portable and adjustable patent writing and reading desks.  
 670.\* J M Curtis: 1 patent wine heater.  
 671.\* S. Kohlberg: paper patterns.  
 672.\* E Hook, Oakland: 4 Townsend's patent kitchen tables.  
 673.\* Miss O'Malley: 2 glass shades, wax flowers.  
 674.\* Theodore Hermann & Co: display of shells, coral, etc.  
 675.\* Addie L Ballou: display of head work.  
 676.\* Wm Wehmoller: display of corrugated stovepipe elbows.  
 678.\* Mrs M V Kemhall: 1 frame natural hair wreath.  
 679.\* H C Root: 1 elipsograph, 2 saw sets and clamp combined.  
 680.\* Mrs W H Worth: 1 frame hair work.  
 681.\* H L Judell: 2 large glass show cases containing samples of ladies and infants underwear goods.  
 682.\* Mrs W F Ferguson: one spice wreath in frame.  
 683.\* Louis W Beanman: 1 sample board set caps and other screws, 1 sample board of nuts and washers, 1 sample board of malleable iron castings, 11 axes, 1 set of Whitney side bar springs attached to a huggy bottom, display of steel castings.  
 684.\* A O Cook: 10 frames of preserved flowers, 2 vases of wax statuary.  
 685.\* Chas A Hawley: 1 model Smith's patent sash balance.  
 686.\* Mrs J Kenneff: 1 frame of sea moss.  
 687.\* C Adolph Low: 10 cases salmon.  
 688.\* M Freud & Son: corsets, underwear and hussies.  
 689.\* Mr Levy: samples of compressed yeast.  
 690.\* Bainard's Business College: fine pen pictures.  
 691.\* Mrs T Corlett: 1 large case wax flowers, 1 music stand, and 3 panels fern painting.  
 692.\* F P Medina: 3 frames shell work.  
 693.\* Mrs C A Woods: 1 piece embroidery.  
 694.\* M MacDonald: display of Eureka stove-pipe.  
 695.\* Miss Ballard: 1 oil painting.  
 696.\* Loi Hing Lung & Co: 10 Chinese chairs 4 tea tables, 1 large tea table, 10 cushions, 2 chair covers.  
 697.\* Miss K Harrington: 1 beaded air castle.  
 698.\* Miller, Sievers & Co: display of hardy evergreens and plants, display of ferns, display of climbers, 1 palm tree, 1 hanging basket, display of cut flowers.  
 699.\* Mrs J E Cotter: 1 basket of wax flowers in glass stand.  
 700.\* D Bruce: 1 show case of hooks.  
 701.\* Blackmar & Davis: 4 Roger's pianos.  
 702.\* I Duffy: display of rustic chairs, sofas, summer houses, vases, hanging baskets, etc.  
 703.\* Miss K L Cole: display of paper patterns.  
 704.\* I N Choynski: old hooks, Rool of Lapil-linus, antiquarian pen and lead pencil.  
 705.\* Holcombe Bros: Carriages. Names—coupelette, landaulette, coupe, rockaway, phaeton, open huggy, and top huggy.  
 706.\* A P Adams: compressed coffee.  
 707.\* Jafferis & Co: display of water-proof crape and lace.  
 708.\* Woodward's Gardens: one oil painting.  
 709.\* D H Jaccard: one model patent door hinge, one patent pin wheel escapement for watches.  
 710.\* Louis Dampf: passe partouts and gold frames.  
 711.\* Francis Smith: wheel harrows.  
 712.\* Mrs E D Lanes: four paintings, three crayons, water color.  
 713.\* Woodward's Gardens: one single specimen of variegated foliage, display of pines, bycops, display of tropical plants, one palm tree.  
 714.\* Thos A Garey: one lot of Garey's Mediterranean sweet orange, and three jars of sample fruit.  
 715.\* McCarthy & Dodge: one lot of elastic stamps.  
 716.\* Birchhoff & Specht: one lot of sunlight printing, maps, drawing of all kinds.  
 717.\* Johnson, Clark & Co: one dress doll.  
 718.\* Vincent Ferraiola: three crayon portraits.  
 719.\* J Renz: one lot of bitters, one lot of blackberry brandy, one lot of Bonanza Bourbon whisky.  
 720.\* H C Langrehr: two mechanical drawings.  
 721.\* B R Prince: one show case of cocoons.  
 722.\* Wells, Hope & Co: display of patent metallic signs.  
 723.\* H W Vaughan: Vaughan's patent photograph.  
 724.\* C H Dodge: display of Dodge's oriental pearl renovator.  
 725.\* David J King & Co: display of patent fountain pens.  
 726.\* M Munion (Sac.): display of peaches.  
 727.\* R B Blowers (Woodland): display of grapes.  
 728.\* B F Flint: one glass case of wool.  
 729.\* Arnes & Dallam: display of Japanese paper oil cloth, carpeting and rugs.  
 730.\* Harishorn & McPhun: display of window shades and opaque shade cloth of California make.  
 731.\* C D & E Hinkley: display of "Star Clipper" spring beds.  
 732.\* Mrs J E Colton: one white wax cross in glass frame, one case of wax fruit, one case of wax magnolia, one frame of autumn leaves, exotic.  
 733.\* N C Mayo: Wait's patent horse feeder.  
 734.\* A L Bancroft & Co: thirteen frames containing specimens of job and label printing, and lithographing.  
 735.\* Mrs H Suttin: two glass show cases of embroidery work.  
 736.\* Miss Swanson: display of ladies' underwear, dress chart.  
 737.\* E H Marwedel: one case of upholstery goods, and stair rods.  
 738.\* Madam Lettreby: one large show case of rice and paper flowers, eighteen shades of paper and rice flowers, one decalcomania picture in leather frame, three decalcomania pictures in frames, three leather frames of paper flowers, three shades of crosses and harps (imitation of Parian marble), one frame card work, one shade containing stone cross and wax wreath.  
 739.\* Thos Saywell: display of begonias, display of cutflowers, display of roses.  
 740.\* Chenery, Souther & Co: 20 dozen of Bennett's Wild Cherry stomach hitters, 4 dozen of California orange bitters, 20 dozen of Dr. Abernethy's green ginger brandy.  
 741.\* W Halkett: 2 light buggies and 1 wagon.  
 742.\* Blunt & Chapman: 1 case containing specimens of natural history.  
 743.\* Menzo Spring: 1 case containing samples of artificial limbs.  
 744.\* Mrs M Morrow: 1 dress cutting chart.  
 745.\* Mrs J B Walter: display of hair restorative.  
 746.\* R W Hathaway: one frame hand point lace work.  
 747.\* Hill & Beebe: display of chemical wonder.  
 748.\* Warner & Hill: display of the "Lightning Eraser."  
 749.\* W F Bailey: one glass case wax flowers.  
 750.\* W K Vanderslice: 1 case quartz jewelry.  
 751.\* G Simonds: samples of Simond's patent night light.  
 752.\* J W Evans: 6 Domestic sewing machines, 4 Grover & Baker sewing machines, 2 cases Domestic paper patterns.  
 753.\* C Deaves: specimens of poster engravings executed on pine.  
 754.\* Wm Jones: encaustic and plain tile pavement, wainscot and hearth, tile and hand painted cut tile.  
 755.\* Falkner, Bell & Co: 2 cases wool.  
 756.\* A Yeoman: 6 small cases containing specimens of natural history.  
 757.\* H F Stevens: display of Pacific coast woods.  
 758.\* J H Gilmore: 1 artificial incubator.  
 759.\* J B Owens: display of iron stone sewer pipe and chimney flues.  
 760.\* S F Journal of Commerce: display of California products, fruits, vegetables, grains, etc.  
 761.\* T G Cockrill & Co: display of Bourbon whisky and J Bumgardner's old rye.  
 762.\* W W Hanscom: display of propeller wheels, one steam pump.  
 763.\* Hinkle & West: one steam governor.  
 764.\* Jos Neuman: display of silk cocoons, silk worms, eggs and raw silk.  
 765.\* Gustave Neuman: silk flags manufactured of California production, raw silk, one silk reeling machine, varieties of cocoons, etc.  
 766.\* S F Journal of Commerce, per George B Walker: display of California made paper and paper material.  
 767.\* Mrs Gerrish: two frames of point lace.  
 768.\* Mrs Kuhn: three frames containing wax wreaths and three containing wreath feathers.  
 769.\* Harmon Westerfeld: one block of compressed yeast.  
 770.\* E F Lorquin, three cases containing display of natural history.  
 771.\* Miss L Marks: one tatting bed set.  
 772.\* Minnie Schnugrass: display of artificial flowers.  
 773.\* J C Wingate: one patent land roller.  
 774.\* Mrs J D Treat: one frame containing transfer pictures.  
 775.\* Kustel & Hoffman: one gold amalgamator.  
 776.\* G Kustel: display of electric galvanic art work.  
 777.\* G M Pease: one new apparatus for fractured clavicle.  
 778.\* G H Miller (apprentice): one architectural drawing.  
 779.\* R F Rochiccoli: two show cases containing samples of galvano-plastic work, display of bronze statuary, two "Centennial" champagne faucet standers.  
 780.\* Gen Geo Deitzler: display of dried fruits, dried vegetables and California raisins—Alden process.  
 781.\* West Coast Furniture Co: four sets of bedroom furniture, one set of dining room furni-



ture, fine assortment of chairs, four easy chairs, two spring mattresses, general display of furniture of California make.

782.\* Miss Lizzie Oppenheimer: one shade of wax flowers.

783.\* H. Westerfeld: one bottle of high wine and one bottle of double refined spirits.

784.\* E. Pardini: display of leather.

785.\* R. Fenkhausen & E. W. Levy: one model of wire rope railroad.

787.\* W. H. Murray: display of California tobacco leaf and California salt, one urn of California polished granite.

788.\* Mrs. N. J. Healy: one shade containing urn of wax flowers, one wax wreath, one wax cross, one frame worsted work.

789.\* G. M. Grant & Co.: one sample barrel and two cases of "Elaine" oil.

790.\* Thos. Tweedale: collection of South Sea Island curiosities.

791.\* Mills & Leak: display of kid and buck gloves and gunnits.

792.\* Miss Fannie Mc Masters: two frames embroidered crochet work.

793.\* R. E. Campbell: twelve patent duplex spring beds and bedsteads.

794.\* F. T. Newbery: two maps of the City of San Francisco.

795.\* Dewey & Co.: two bound volumes of the WEEKLY MINING AND SCIENTIFIC PRESS, and WEEKLY PACIFIC RURAL PRESS, five different sizes of Dewey & Co.'s patent elastic hinge newspaper file holder. Also (for exhibition only) MECHANIC'S FAIR DAILY newspaper printing establishment, and J. M. Bassett's one cylinder Hoe steam printing press.

796.\* Wm. Beeman: one case containing a sample of elastic work truss abdominal supporters, pads, braces, etc., appliances for remedying curvature and other deformities.

797.\* Mrs. S. A. Kincaid: one crochet bed spread, one pair crochet pillow shams, crochet tidies.

798.\* West Coast Furniture Co.: display of wood and rattan baskets of California make.

### The Burleigh Tunnel.

This tunnel now penetrates into Sherman mountain a distance of 2,200 feet, and is still being driven in as fast as the Burleigh air compressors and high explosives, guided by skill and experience, can accomplish the work, which is at the rate of about two feet per day. Messrs. Loring, Nickerson and Green are the contractors, and they are progressing satisfactorily, though not as fast as they have done the past four months, on account of the increasing hardness of the rock. The holes are drilled with double-fluted drills from six to eight feet deep; the boring machinery is run back on the track about 200 feet and the blasts exploded. The gases resulting from the combustion of the giant powder are highly noxious, but the deleterious effects are more likely to be felt a distance of 200 feet or more from the heading of the tunnel than right up at the breast where air is supplied by the compressors.

Twenty lodes have already been intersected by this colossal prospecting enterprise, two of which have been worked extensively, and immense quantities of ore have been taken out. The principal lode, as yet discovered, is the New Era, which generally carries a body of solid ore from two to three, and in some places as much as four feet in thickness. This, however, is of low grade, but owing to the increasing facilities for transportation and treatment of this class of ore, it cannot fail to prove highly remunerative; indeed, a vein half the size of this would be a bonanza in any other place than Clear Creek county, where silver is the ore that is most particularly sought after and devoutly wished for; but the time is not far distant when many of the mines in this county that have not been touched for years will be actively worked for the lead they contain and will yield handsome profits to their owners.

The New Era was cut 920 feet from the commencement of the tunnel, and has been opened out by drifting 250 feet each way. Fifty feet west from the tunnel a winze 40 feet deep has recently been sunk, and a drift is being run west from a point in the shaft 35 feet below the tunnel level. This will open up a stope carrying a vein of galena of incredible size, and undoubted permanency, the upper edge of which forms the floor of the drift above. This lode is fourteen feet in width, dips to the north at an angle of 35°, and its course is nearly east and west.

The Rider lode is 1,700 feet from the tunnel's entrance, and has been explored some, though nothing like the New Era. We did not examine this vein, but Mr. Loring, the foreman, to whom we are indebted for much valuable information and a ride on the car from the breast to the mouth of the tunnel, informs us that a drift has been run east on the lode 40 feet, and another one west 80 feet.

We have confidence to believe that the persevering efforts of the Burleigh tunnel company to discover something else will ultimately be rewarded, and we never know the day or the hour that we may be called upon to chronicle the discovery of the "biggest thing yet" by this company in the unexplored interior of Sherman mountain.—*Colorado Miner.*

### Newspaper Fileholders.

Dewey's new elastic fileholders (black walnut), size of the PRESS, Harper's Weekly and Scientific American, for 50 cents. Larger sizes to suit any newspaper, 75 cents. By mail, postpaid, 10 cents extra. Cash with all orders. Patent allowed. Address, Dewey & Co., Publishers, San Francisco.

## Facts for Pacific Coast Inventors.

MINING AND SCIENTIFIC PRESS,  
PATENT AGENCY, S. F.

Our reputation as Patent Solicitors has been obtained by long experience, painstaking in our work, and fair dealing with our clients. We charge reasonable fees and do our work well. We charge for each case according to the amount of work involved. Our cases are prepared by members of the firm who have been in the business over twelve years, and we do not intrust the preparation of cases to boys or employees. A firm that employs boys at five and six dollars per week to write specifications, can afford to advertise and take cases at a uniform rate of \$20 or \$25 a case, but the inventor does not usually find it the cheapest plan to employ such aid. If it is worth a hundred dollars to prepare a case and secure a patent, we charge a hundred dollars. If we can afford to do the business for twenty dollars, we only charge that much. A blacksmith might as well advertise that he will do all kinds of jobs from the shoeing of a horse to the ironing of a wagon for one price, as for a patent solicitor to say that he can prepare and prosecute all kinds of cases (and do them right) for any one fixed price. It is not common sense. And if we were the inventor we should at once distrust the agent who made us the proposition. We would think that he was in the habit of slighting his client's work. If a person will send us his model, so that we can see what we have to do, we will tell him what we can do his work on that case for, and we always satisfy our clients. We have succeeded in securing the patronage of every inventor who has taken his work from Eastern agents and given us a fair trial. We do the work better and more promptly. The inventor can come and see us and explain matters orally, if an explanation is required, and if we make a mistake or fail to do our duty, he can always reach us with a "long-enough pole."

DEWEY & CO.,  
202 Sansome street, S. F.

## Business Directory.

OLIVER H. GRAY. JAMES M. HAVEN  
GRAY & HAVEN,  
ATTORNEYS & COUNSELLORS AT LAW  
In Building of Pacific Insurance Co., N. E. corner California and Leidesdorff Streets,  
SAN FRANCISCO.

WM. BARTLAND. HENRY KIMBALL  
BARTLING & KIMBALL,  
BOOKBINDERS,  
Paper Rulers & Blank Book Manufacturers,  
505 Clay Street, (southwest corner Sansome),  
SAN FRANCISCO.

HUNT, DOUGLAS & STEWART Process,

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Wooden Amalgamating Pans and Settler.

This is a complete, perfect and economical adaptation of the humid method to the treatment of Gold or Silver ores, associated with

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And other base metals, or to ores free from base metals. It can be adapted to any first-class Gold or Silver mill, at a reasonable additional expense.

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Georgetown, Colorado.

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The undersigned, owners of LESCHOT'S PATENT for DIAMOND POINTED DRILLS, now brought to the highest state of perfection, are prepared to fill orders for the IMPROVED PROSPECTING AND TUNNELING DRILLS, with or without power, at short notice, and at reduced prices. Abundant testimony furnished of the great economy and successful working of numerous machines in operation in the quartz and gravel mines on this coast. Circulars forwarded, and full information given upon application.

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At the highest prices; also, treated on Commission at low rates.

DEETKEN & KRUSE'S Reduction Works.

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### JOHN L. BOONE,

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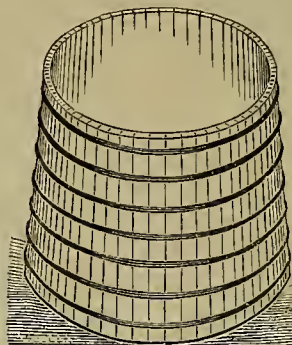
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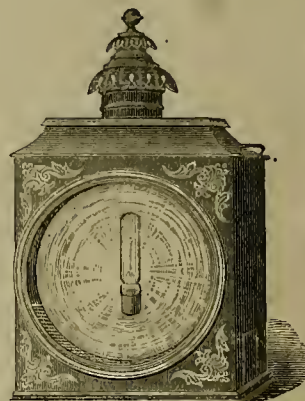
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All persons, excepting those having the right by purchase from me, are hereby cautioned against using, or making, or selling any device for turning the discharge pipes of hydraulic machines which uses the deflecting force of the stream of water.

Any such device is an infringement of United States Letters Patent, granted to me on the 16th of May, 1876, and re-issued September 19th, 1876.

I have commenced suit against Richard Hoskin for infringing my said patent, and intend to prosecute all parties using such Deflectors without license from me, there being no other way to protect my rights.

Any parties wishing to purchase the right to use this device can do so by making application to me.

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RICHEST LEDGES IN ARIZONA.

Money needed for development. The ore will pay a handsome margin to ship to the city. Apply at this office.

## ARTIFICIAL LIMBS!

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Continued from page 117.

cited over recent discoveries in that vicinity. A few weeks ago we made mention of a claim located by Doc. Holmes, showing good prospects. It seems that further development on this claim has exposed a well-defined ledge, seven feet wide, which assays over \$100 to the ton, and gives promise of increasing in quantity and richness as it is opened out. This has set others to prospecting, and our informant states that claims are being staked off all round the prospect location. Doc. Holmes' mine is about half a mile due east of the mouth of the Eberhardt & Aurora tunnel, but on higher ground, and easily accessible by wagon.

**THE SHAFES.**—Work on the Jennie A. and Kingmines, on White Pine mountain, has been somewhat retarded for the last two weeks on account of bad ventilation, which necessitated the sinking of air shafts. This work has now been completed in both mines, and the work of development resumed. The Jennie A. has put in an air-blower to clear the mine of deleterious gases which settle at the bottom of the incline. Neither company expect any more trouble on account of ventilation for a long time to come.

**A RICH SPECIMEN.**—Yesterday we saw a beautiful specimen of silver ore from the Safford mine, on Treasure Hill. Experts say it will go \$1,000 to the ton, and the gentleman who took it out assures us the ore body from which the specimen was taken showed a breast of 30 feet and was 10 feet high.

## Arizona.

**MINERAL PARK.**—Cor. *Arizona Enterprise*, Aug. 15: In Mineral Park I found times very dull, but it is expected that the mill will start up soon and run on custom ore and tailings, in which case the town will again have life distilled into it.

There are ten or twelve men chloriding on the Keystone, and they are getting out some ore that will work as high as \$1,200 to the ton.

**MAYNARD DISTRICT.**—A mill will soon be put up on the Dean mine in Maynard district, Wallapai mountains. The parties who bonded the mine have paid \$13,000 in cash. They are to put up a 10-stamp mill on the mine, and if they do not, by the 1st of August, 1878, pay down \$200,000, they are to forfeit the mill and the \$13,000 already paid. Mr. S. Shoultes has recently shipped from the American Flag mine, also in Maynard district, about eight tons of ore that will work \$2,000 per ton.

The old Hackberry mill has been fixed up to work tailings, and it is turning out a considerable quantity of bullion. A day or two ago Mr. Towle, one of the owners, passed through here, en route to the river, with \$6,000, or \$7,000 worth of bullion extracted from these tailings. The new mill will be up in a few months, and then look out for lively times in the vicinity of this famous rich mine. On the 450-ft level they have struck a large body of rich ore, and the mine at this depth makes a better showing than ever before.

**AZTEC.**—*Arizona Citizen*, Aug. 15: Manager Magee came in from the Aztec mine yesterday, with the best of news regarding its development. There is in the open cut a body of solid ore, 6x8 feet, of very rich ore. He brought in about 100 pounds, one piece weighing over 50, and bears evidence of coming from a large vein. Samples of this class of ore were recently assayed in San Francisco, and gave over \$200 per ton. Mr. Magee is about as well pleased with the prospects as any man would care to be under like circumstances.

**ORO BLANCO.**—Mr. Flood is in town from Oro Blanco district. He says the Alaska, Warsaw and other veins himself and partners are developing, show so favorably that next week they intend to begin building a furnace of a daily capacity of five tons. As Mr. Kirkpatrick said some weeks ago when in here, it is the intention to build up gradually and make no failure. They have the ore with silver in paying quantities, and they do not intend to put up very extensive or expensive machinery until they demonstrate just the kind needed to work the ores most profitably.

## Montana.

**SILVER CREEK QUARTZ.**—*Helena Independent*, Aug. 16: Mr. John Murphy is running his mine, which is reported to be paying well. Up the Silver creek road, Messrs. Mayer & Collins have a forest of 10 men at work. The mine pays its owners well. Mr. Thos. Cruse has an arastra near Collins & Mayer's mine. He is crushing ore from the Dinnunum lode, and is doing first-rate. A few miles above is the little town of Idaville. There is a 10-stamp mill and two arastras running steadily and producing a good deal of gold retort. Further up is the town of Cotterville, which is growing rapidly. At this place is located a 10-stamp mill, belonging to Mr. Milo Courtwright. The Bluebird lode, which furnishes the above mill with ore, is a very fine one and is yielding about 40 tons per day. The lode is 18 feet wide at the bottom of the shaft—56 feet. Several levels are being run. There is now on the dump 400 tons of good ore. The owners, Cotter, Hickey & Tierney, expect to erect a 20-stamp mill this fall. Henry Brooks has struck an extension of the Bluebird, and it is as rich as the original. There are several other fine lodes in the neighborhood. There is no doubt that at no distant day this district will be regarded as the most productive in the Territory.

**SILVER MILL IN ELK HORN DISTRICT.**—*Butte Miner*, Aug. 16: Hon. C. Mead, of Bannock, left Butte on Saturday, with a large portion of the machinery for a silver mill he is building in the Elk Horn district, Beaverhead county. The mill will consist of a 25-horse power boiler and engine, six 70-pound stamps, two Purvine pans of large size and one Purvine settler. Will crush and treat a capacity of eight tons per day. The ores of this district are measurably free from lead, zinc, antimony and arsenic; are rich in silver and carry a liberal percentage of carbonate and oxide of copper, with silicious gangue, which, with the fact of their great abundance, makes them very desirable ores for raw amalgamation. The Judge expected himself to be much pleased with Butte, and well satisfied with the work done at A. F. Allen's foundry, which is now turning out castings of excellent quality and good finish. Such enterprises as this of Judge Mead's will do more to give Montana railroad communication with the outside world than all the cheap talk and poor legislation of an entire age.

## Oregon.

**APPROPRIATE MINES.**—*Oregon Sentinel*, Aug. 15: This section of country is becoming famous for the new mines that have been discovered there of late. Very little work has been done so far to prospect them, but the indications are that it will pay to take one of our mining districts. The great advantage it has over our other mines is the abundance of water which can be brought to the mines at a very small cost. The ditch of Pape, Smith & Co. has been completed and work commenced, and they will now have a sufficiency of water to work their claim all the year round. That of Klippel, Hanna & Co. is in course of construction, and will be finished this fall. Considerable capital has been brought into this county lately, which is being used in developing our mines, and a prosperous season may be expected.

## Utah.

**BEAVER DISTRICT.**—Cor. *Salt Lake Tribune*, Aug. 16: Matters remain at a stand-still here in this camp, and I am afraid will continue to for a number of weeks to come unless lead takes another bound and goes up to \$65 at least. Mr. Schofield, the business manager of this smelter, visited us a short time ago and paid up the indebtedness of the concern, and then started for New York. He states that he will return and start things again. The mines look well—those that are being worked—and the Gentile miners are running. The new Godbe smelter will start up soon; the town is growing, and the Big Horn silver mine still gets bigger and richer. The smelter at Millford is also running. Bring down the price of transportation and the price on goods, and the

miner can live in this part of Zion, even at the low price of lead. We don't mean to give up the ship, at any rate.

**SILVER REEF.**—*Pioche Record*, Aug. 18: From Captain Lubback we learn that affairs at Silver Reef, Utah, are moving along with rather better prospects. The Last Chance mine, on Tecumseh Reef, had struck a rich body of ore. Barber is having his ore crushed at the Goss mill, which is working satisfactorily, except in regard to prices charged. The Captain shipped a wagon load of hardware from Pioche to Silver Reef for use in the mines of which he has charge.

**LEADS BULLION.**—\$9,797.76 in bullion arrived in Pioche from Silver Reef during the week.

## The Progress of the Sutro Tunnel.

The Sutro tunnel, one of the great engineering feats of the century, is already within the eastern boundaries of the great Comstock lode, which it is designed to tap, and there are less than 2,000 feet to run to bring the header into the Savage mine workings. The fact is now established that the workmen at the bottom of the Savage-Chollar-Norcross combination shaft and those in the tunnel can bear each other blasting; the first connection of the tunnel will be with this shaft. The question of the utility of the tunnel, and the numerous arguments in connection with the matter, have been discussed so thoroughly that there is no necessity of anything being said on the subject at this time. Great energy has been displayed by the projectors in every way, and the work has been skillfully carried out as well as quickly. More than ordinary interest is centered in the tunnel at this time, as many advantages are expected from its connection with the lode, and it is now at a place where it will settle many questions in connection with the quartz veins to the eastward.

The tunnel was started the 19th of October, 1869, and during the remainder of that year 460 feet were cut. The *Gold Hill News* publishes the following figures of comparative progress, which are of interest:

In 1870 the total progress made was 1,200 feet, and the average monthly progress 107½ feet. During 1871 the total distance run was 915 feet, and the average monthly progress 76¼ feet. In 1872 the total progress was 815 feet, and the average per month 66½ feet. During 1873 the total distance run was 1,919 feet, and the average per month, including 555 feet of drifts run east and west from the bottom of shaft No. 1, was 105 4-12 feet. In 1874 the total distance made was 2,680 feet, the average per month being 223 4-12 feet. On the first day of April of that year the first Burleigh drill was started. June 2d four drills were in operation, and on the 7th day of August, six drills were at work in the face. During 1875 the total distance made was 3,728 feet, and the average per month 310 8-12 feet. In 1876 the total distance run was 3,670 feet, and the average per month 305 10-12 feet. During 1877 the total distance run to August 1st was 2,134 feet, and the average to that date was 305 feet. Since the first of August the average daily progress has been about 11 feet, so that, if nothing serious happens to prevent, the total progress for the year 1877 will not fall much, if any, short of 4,000 feet. At the present rate of work an average of 2,000 car loads of rock, weighing two tons each, are removed monthly.

A *News* reporter entered the tunnel this week, and we condense the following from his observations: It was time for changing shifts, and our party were clad in the most grotesque habiliments, with a long train of low cars following after, each car loaded with four brawny miners in working costume, and carrying flashing lights. The whole train was drawn by a stout mule, with a flaming torch fastened to its collar to light it through the midnight gloom. Taken together with the continually changing scenes of the tunnel, as they flitted quickly past us, the whole formed a comic and interesting picture. The distance from the mouth to face of the tunnel is 17,797 feet, a little less than three and one-half miles. Our mule was driven the greater part of the distance at a fast trot, and it was just one hour from the time of starting until we reached the face of the header, or end of the tunnel.

The face of the tunnel is in soft porphyry, carrying streaks of clay, the whole having the exact appearance of the material that lies next to and adjoining the east wall of the Comstock. It is of just such a character as would lead a miner or an expert to expect the striking of a quartz ledge at any moment. The face of the tunnel has now reached a point 300 feet west of shaft No. 4, and 642 feet east of a direct north and south line from the Savage-Chollar-Norcross combination shaft, which point is 18,439 feet from the mouth of the tunnel. The flow of water from the header is 73 inches. The temperature of the water at this point is 94 and at the mouth of the tunnel 77 degrees Fahrenheit. The temperature of the air at the header is 97 degrees, but is pure, and the men have no difficulty in working. The compressed air for driving the drills in the face and ventilating the tunnel is brought from shaft No. 2, a distance of 10,487 feet. The number of men employed in the header at present is 49, one shift of which, the day before our visit, sent out 42 carloads, containing two tons each, of rock.

A drain tunnel, 1,100 feet in length, has been completed from east of the machine shop, at the mouth of the tunnel, and a shaft sunk 60 feet

in depth to the level of the tunnel. The design of this drain is to create a fall of 60 feet for the water, to obtain a sufficient power to run the entire machinery of the machine shop without the cost of steam. The water from the tunnel will be turned downward through this shaft, at the bottom of which one of Leffel's 13½-inch turbine water-wheels will be placed, capable of making 700 revolutions per minute, and which will furnish 50-horse power. This, it is estimated, will run with ease the entire machinery of the shop. The water, after passing through the drain, will then be used for irrigating purposes by the farmers along the banks of the Carson. The total number of men employed at the tunnel, including foremen, clerks, miners, and other employees, is 82. Mr. Sutro confidently expects the tunnel to reach the workings of the main Comstock by the 1st of January, 1878.

## The Mechanics' Institute Library.

The exhibitions which are given under the auspices of the Mechanics' Institute are not for the individual profit of any one person or set of persons. Whatever profits there are are turned over to the treasury of the Institute, but if there are any losses, the Trustees have to bear them personally. This is a great risk to run or the Trustees, but not for the Institute. The Trustees take all the trouble and risk, with no chance of profit, so that the Library Association reaps the benefit without expense or chance of loss.

The object for which these exhibitions are given is in every way a worthy one. The collection of a large public library is no easy or inexpensive task. To obtain a good standard, as libraries are rated now-a-days, a great deal more money must be spent than usually comes from the monthly subscribers alone. This income is about sufficient to keep the library running, but when it comes to purchasing even half of the books that are published and worthy of a place on the shelves, this amount is insufficient. Text books and works of reference especially are costly, and this class of works are more in demand than others at a Mechanics' Institute.

The library has now a splendid set of works of reference, and is a credit to the city and the coast. New works, however, come out every day and a certain proportion of these are absolutely necessary to keep the library up to the proper standard. With the ordinary funds of the library it would be impossible to make any reasonable additions to the stock of books. For this reason, these exhibitions were inaugurated so that the library would have some pecuniary gain outside of its ordinary income.

The experiment proved so successful that eleven different exhibitions have been given under the auspices of the Institute. These fairs serve also a double purpose, as they give an opportunity for mechanics and manufacturers to display the result of their handiwork and skill in the different branches, and afford to the residents of the coast an opportunity to examine for themselves what can be done here. The Industrial Exhibition deserves the hearty support and encouragement of all progressive citizens, when it is given for such worthy objects.

## A Handy Workman.

Mr. I. A. Heald, machinist, 514 Commercial street, in this city, is an artisan of the right stamp—a man of "good mettle" and "true ring." His work is ditto. We have known him for many years, and can recommend him fully. The *Washington City Chronicle* describes Mr. Heald's former shop in that city in the following happy manner: "We were truly amazed at the skill being there displayed. Models of the most intricate character, machiucs composed of many parts, and of various kinds of metal and wood—all, when set in motion, working smoothly and in perfect order. Every manner of tools are kept on hand with which to perform this difficult work. Models for patents and general machine jobbing are all executed, either in wood or metal, at short notice. Sewing machines, printing presses, musical instruments, and, in fact, anything composed of wood or metal, will be neatly and promptly executed under the immediate supervision of Mr. Heald himself, he having had a large experience at the Washington navy yard, and in other cities. Mr. Heald is also an accomplished musician, being leader of the American brass band."

## Meetings and Elections.

**MARTIN WHITE M. Co.**—August 16. Directors—Annis Merrill, Jno. A. Hooper, C. H. Stanyan, F. D. Sawyer and Mark Shepard.

**CALEDONIA M. Co.**—August 17. Trustees—Geo. W. Beaver, L. S. Adams, R. F. Morrow, W. S. Hobart, John S. Hobart, John Skaa. Officers: Geo. W. Beaver, President; L. S. Adams, Vice-President; R. Vaguer, Secretary.

**OCCIDENTAL M. Co.**—August 17. Trustees—F. H. Follis, C. H. Fish, Geo. R. Wells, Geo. Wallace, C. O'Connor, Officers: R. H. Follis, President; James G. Fair, Superintendent; A. K. Durbrow, Secretary.

**LUCY ROCK M. Co.**—August 20. Trustees—L. L. Blood, Chas. K. Colby, Ernestus Gunn, Jas. Kellogg, G. L. F. Reen. Officers: L. L. Blood, President; E. G. Colby, Superintendent; Chas. S. Healy, Secretary.

**KENTUCKY RUCO M. Co.**—August 20. Trustees—B. A. Becker, J. B. Reynolds, Jas. K. Byrno, G. S. Johnson, Chas. Snyder, Officers: B. A. Becker, President; F. J. Herrmann, Secretary.

FRED. A. MOORE has become local editor of the *Santa Barbara Press*.

## PATENTS AND INVENTIONS.

### A Weekly List of U. S. Patents Issued to Pacific Coast Inventors.

(FROM OFFICIAL REPORTS FOR THE MINING AND SCIENTIFIC PRESS, DEWEY & CO., PUBLISHERS AND U. S. AND FOREIGN PATENT AGENTS.)

By Special Dispatch, Dated Washington, D. C., August 7th, 1877.

FOR WEEK ENDING AUGUST 7TH, 1877.

**FIRE ESCAPES.**—Benjamin F. Frank, Colfax, Cal.  
**TIGHTENING AND STRETCHING ROPES, BELTS, ETC.**—William Eppelsheimer, S. F.  
**CARPET FASTENERS.**—Jesse Tailing, Umatilla, Oregon.  
**DRIERS FOR FRUIT AND OTHER ARTICLES.**—George Harris, Petaluma, Cal.

LABEL.

**THE STOCK CONDITION POWDER.**—Painter & Calvert, S. F.

—The patents are not ready for delivery by the Patent Office until some 14 days after the date of issue.  
NOTE.—Copies of U. S. and Foreign Patents furnished by DEWEY & CO., in the shortest time possible by telegraph or otherwise) at the lowest rates. All patent business for Pacific coast inventors transacted with perfect security and in the shortest possible time.

## General News Items.

SEVEN thousand men will leave Spain for Cuba between now and the 20th of September.

THE Western Union and Atlantic and Pacific Telegraph Companies have been consolidated, and are now practically one company.

THE failure of Gamewell & Co., builders of fire alarm telegraph lines, was announced in New York Saturday.

THEY have recommended shipping ore from the copper mines at Copperopolis, above Stockton, to Europe.

THE Treasury Commissioners are engaged in making a series of practical tests, with the view of ascertaining the actual consumption of fuel at the Mint.

PAPERS are being prepared, at the instance of J. C. Morrison, Jr., complaining of a Chinese washhouse, next door to his residence on Howard street, as a dangerous nuisance.

THE Newark City Silk Mills, of Newark New Jersey, have resumed work with half their usual force, with wages as agreed upon by the proprietors and strikers. The Vise and Tool Works at Treuton, New Jersey, have also resumed work.

THE *Sun's* Scranton special says: Between 50,000 and 60,000 miners are now idle in this district, and it is estimated that the sale of at least 300,000 tons of coal has been lost to this region since the strike began. One lot of miners rejected the terms of the masters, demanding an advance of 25 per cent. in wages.

THE Treasury Department declares the importation of sugars, artificially colored for the purpose of securing their entry at the Custom House at a lower rate of duty than would be charged upon colors attained in the ordinary process of manufacture, is regarded as a direct evasion of the revenue law, and all importations of that character made in the United States after October 1st next, will be seized for forfeiture.

THE annual State Fair of California will commence at Sacramento on the 17th of September, and continue through the week. It is the intention of the managers to make the exhibition complete; and \$40,000 in cash premiums will be distributed. The racing will be a prominent feature, and will include the best stock. A premium of \$100 will be offered for the most valuable gold bar exhibited.

WOODWARD'S GARDENS has the following new attractions: The buffalo chase; large whale skeleton; new museum; improvements in the zoological department, besides the other features which have made it popular.

Any person receiving this paper after giving an order to stop it, may know that such order has failed to reach us, or that the paper is continued inadvertently, and they are earnestly requested to send written notice direct to us. We aim to stop the paper promptly when it is ordered discontinued.

## Signal Service Meteorological Report.

Week Ending August 21, 1877.

HIGHEST AND LOWEST BAROMETER.							
Aug. 15	Aug. 16	Aug. 17	Aug. 18	Aug. 19	Aug. 20	Aug. 21	
25.91	29.97	30.00	30.00	30.07	30.11	30.08	
29.86	29.92	29.94	29.92	30.01	30.06	29.99	
MINIMUM AND MAXIMUM THERMOMETER.							
62	65	64	63	67	67	67	
53	54	55	54	57	55	55	
MEAN DAILY HUMIDITY.							
85	82	83	86	78	76	76	
PREVAILING WIND.							
SW	SW	W	W	W	W	W	
WIND—MILES TRAVELED.							
289	247	325	315	287	332	300	
STATE OF WEATHER.							
Foggy.	Fair.	Fair.	Fair.	Fair.	Clear.	Clear	
RAINFALL IN TWENTY-FOUR HOURS.							
Total rain during the season, from July 1, 1877, 0.02 in							

We can recommend the New York watch, of Springfield, Mass., as A 1.



METALS.

WHOLESALE.  
THURSDAY, M., August 23, 1877.

IRON—		
American Pig, ton.	28 00	63 20
Scottish Pig, ton.	32 00	63 20
White Pig, ton.	24 00	—
Oregon Pig, ton.	30 00	—
Refined Bar.	3 00	64
Horse Shoes, keg.	5 00	—
Nail Rod.	—	71
Norway, Ural.	—	71
Refined.	—	—
COPPER—		
Copper Tinned.	37 00	40
Sheeting, B.	37 00	40
Sheeting, Yellow.	21 00	22 1/2
Sheeting, Old Yellow.	10 00	11
Composition Nails.	21 00	—
Composition Bolts.	24 00	—
STEEL—		
English Cast, B.	14 00	25
Anderson & Woods, ordinary sizes.	16 00	—
Drill.	16 00	—
Flat Bar.	15 00	18
Plow Steel.	8 1/2	12 1/2
TIN PLATES—		
10x14 1/2 Charcoal.	8 50	9 00
Bacon Tin.	24 00	—
Amalgam.	19 00	20
ZINC—		
By the Cask.	11 00	—
Zinc Sheet 7x10, 7 to 10, B.	11 00	—
7x10, 11 to 14.	11 00	—
8x10, 5 to 10.	12 00	—
8x10, 11 to 10.	12 00	—
NAILS—		
Assorted sizes.	3 00	63 25
Q. & K. Nails.	—	—
By the Bin.	47 1/2	50

GENERAL MERCHANDISE.

WHOLESALE.  
WEDNESDAY M., August 22, 1877.

BAGS—Jubbing.		
Eng Standard Wheat, 11 1/2 #121.	24 30	—
Neville & Co's.	24 30	—
Hand Sowed, 22x33, 11 1/2 #121.	24 30	—
Machine Sowed, 22x33, 11 1/2 #121.	24 30	—
Flour Sacks, halves.	8 1/2	—
Quarters.	5 1/2	—
Eights.	4 1/2	—
Twelves, 50 lbs.	4 1/2	—
45 lbs.	9 1/2	—
40 lbs.	8 1/2	—
Wood Sacks.	—	—
Hand Sowed, 3 1/2 B. 45 #.	45 00	—
Machine Sowed.	45 00	—
4 B.	45 00	—
Standard Gunnies.	15 1/2	—
Bean Bags.	7 1/2	—
CANNED GOODS.		
Assorted Pie Fruit.	2 1/2	63 00
2 1/2 cans.	2 1/2	63 00
Table do.	3 75	61 25
Jams and Jellies.	4 25	61
Cakes, 1st qt.	3 50	61
Sardines, 1/2 box.	65 00	61
Hf Boxes.	3 00	—
Preserved Beef.	—	—
2 lb. doz.	4 50	—
do. 4 lb.	5 50	—
Preserved Mutton.	—	—
2 lb. doz.	4 60	—
Beef Tongue.	5 50	—
Preserved Ham.	—	—
2 lb. doz.	6 50	—
Deviled Ham, 1 lb.	—	—
do.	5 50	—
do. Ham, 1 lb.	5 50	—
COAL—Jubbing.		
Australian, ton.	9 00	9 50
Coal Bay.	7 00	—
Bellingham Bay.	7 00	—
Seattle.	14 00	—
Cumberland.	14 00	—
Mt. Diablo.	4 75	5 75
Lehigh.	22 00	—
Liverpool.	9 00	—
West Hartley.	9 00	9 50
Scotch.	8 25	9 00
Scranton.	13 00	16 00
Vancouver Id.	7 50	—
Charcoal, sack.	7 50	—
Coke, blk.	60 00	—
COFFEE.		
Sandwich Id, B.	21 1/2	—
Costa Rica.	15 00	20
Guatemala.	15 00	20
Java.	25 00	—
Manila.	19 00	19 1/2
Ground, in cs.	25 00	—
FISHL.		
Sae to Dry Cod.	6 1/2	6
do. in cases.	6 1/2	6
Eastern Cod.	7 1/2	8
Salmon, blks.	9 00	10 20
Hf blks.	4 75	5 25
2 B cases.	2 10	20
Pkld Cod, blks.	22 00	—
Hf blks.	11 00	—
Mackerel, No. 1.	14 00	15 00
Hf Blks.	3 00	3 25
In Kits.	3 00	3 25
Ex Mess.	3 50	4 00
Pkld Herring, bx 300	3 00	3 50
Boston Smoked 11 1/2	40 00	50
LIME, Etc.		
Best, Sta Cruz.	2 00	2 25
hbl.	2 00	2 25
Cement, Rosen.	2 75	3 00
Portland.	4 75	5 50

LUMBER.

WEDNESDAY M., August 22, 1877.

CARGO PRICES OF PUGET SOUND PINE.		
REDWOOD.		
Rough, M.	14 00	15 00
Refuse.	14 00	15 00
Clear.	24 00	25 00
Clear Refuse.	14 00	24 quality.
Rustic.	27 50	28 50
Refuse.	24 00	25 00
Surfaced.	24 00	25 00
Refuse.	14 00	15 00
Flooring.	25 00	26 00
Refuse.	14 00	15 00
Beaded Flooring.	25 00	26 00
Refuse.	14 00	15 00
Half-inch Siding.	20 00	21 00
Refuse.	14 00	15 00
Half-inch Surfaced.	20 00	21 00
Refuse.	14 00	15 00
Half-inch Battens.	18 00	19 00
Pickets, Rough.	12 00	13 00
Rough, Pointed.	14 00	15 00
Fancy, Pointed.	18 00	19 00
Shingles.	2 00	2 25

Gold, Legal Tenders, Exchange, Etc.

[Corrected Weekly by SUTRO & Co.]  
SAN FRANCISCO, August 23, 3 P. M.  
LEGAL TENDERS IN S. F., 11 A. M., 95. SILVER BARS, 9@16 1/2 cent. disc.  
GOLD IN NEW YORK, 105.  
GOLD BARS, 90. SILVER BARS, 9@16 1/2 cent. disc.  
EXCHANGE ON NEW YORK, 1%; on London bankers, 48;  
Commercial, 49; Paris, five francs 1/2 dollar; Mexican dollars, 94@95.  
LONDON CONSOLS, 94 3/16; Bonds, 107.  
QUICKSILVER IN S. F., by the flask, 1 lb, 52 1/2.

LEATHER.

WHOLESALE.  
WEDNESDAY M., August 22, 1877.

Sole Leather, heavy, lb.	26 00	29
Light.	22 00	24
Jolot, 8 Kil, doz.	48 00	50 00
11 to 13 Kil.	50 00	52 00
14 to 19 Kil.	52 00	54 00
Second Choice, 11 to 16 Kil.	57 00	60 00
Cornellian, 12 to 16 Kil.	57 00	60 00
Females, 12 to 13 Kil.	63 00	67 00
14 to 16 Kil.	71 00	76 50
Simon Ulmo, Females, 12 to 13 Kil.	58 00	62 00
14 to 15 Kil.	66 00	70 00
Simon, 15 Kil.	72 00	77 00
20 Kil.	65 00	67 00
24 Kil.	72 00	77 00
Robert, 7 and 9 Kil.	35 00	40 00
Ripe, French, lb.	1 00	1 35
Cal. doz.	40 00	60 00
French Sheep, all colors.	8 00	15 00
Eastern Cal for Backs, lb.	1 00	1 25
Sheep Roans for Topping, all colors, doz.	9 00	13 00
For Linings.	5 50	10 10
Cal. Russel Sheep Linings.	1 75	4 50
Boat Lega, French Cal, pair.	4 00	—
Good French Cal.	4 00	4 75
Best Jodut Cal.	5 00	5 25
Leather, Harness, lb.	35 00	38
Pair Bridle, doz.	48 00	72 00
Stirring, B.	33 00	37
Wool.	30 00	65 00
Buff, ft.	18 00	20
Wax Side.	17 00	18

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The Explorers', Miners and Metallurgists' Companion  
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The New York watch, made at Springfield, Mass.  
Why is it the best watch?  
Because it is substantial in all its parts, constructed on  
the best principles and embodies those improvements  
which experience has shown to be the most desirable.  
Why is the New York Watch so popular?  
Because in buying one you are sure of getting a good  
time-keeper. While purchasing a watch of most other  
makes is like investing in a lottery—a great many blanks  
to one prize.  
Which is the cheapest watch?  
The most economical is the New York watch. For you  
can get one of these excellent time-keepers for less than it  
costs in a short time to patch up a poor watch, which  
benefits no one but the repairer.  
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makers and Jewelers, DEWEY & JORDAN, 433 Mont-  
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Scientific Press, 224 Sansome St., San Francisco.

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Bella Union Quicksilver Mining Company.

Location of principal place of business, San Francisco,  
California. Location of works, Napa County, California.  
Notice.—There are delinquent upon the following de-  
scribed stock, on account of assessment No 2 (2), lev-  
ied on the twenty-eighth day of June, 1877, the several  
amounts set opposite the names of the respective share-  
holders, as follows:

holders, as follows:			
	No. Cert.	No. Shares.	Amount.
Donnell, E. J.	30	100	\$100 00
Donnell, E. J.	31	100	100 00
Donnell, E. J.	32	100	100 00
Donnell, E. J.	33	100	100 00
Donnell, E. J.	34	100	100 00
Donnell, E. J.	35	100	100 00
Donnell, E. J.	36	100	100 00
Donnell, E. J.	37	100	100 00
Donnell, E. J.	38	100	100 00
Donnell, E. J.	39	100	100 00
Donnell, E. J.	40	100	100 00
Donnell, E. J.	41	100	100 00
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Donnell, E. J.	43	100	100 00
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Donnell, E. J.	171	100	100 00
Donnell, E. J.	172	100	100 00
Donnell, E. J.	173	100	100 00
Donnell, E. J.	174	100	100 00
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GEO. W. FOGG, Supt.

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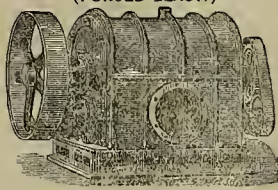
For Chloridizing, Desulphurizing and  
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ROTARY PRESSURE BLOWER  
(FORCED BLAST.)**



WARRANTED SUPERIOR TO ANY OTHER  
J. C. SENDERLING, Sole Ag't Pacific Coast,  
51 Fremont Street, S. F.

**The Ingersoll Rock Drill**



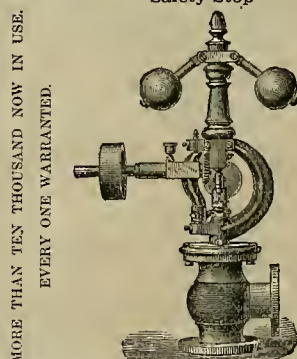
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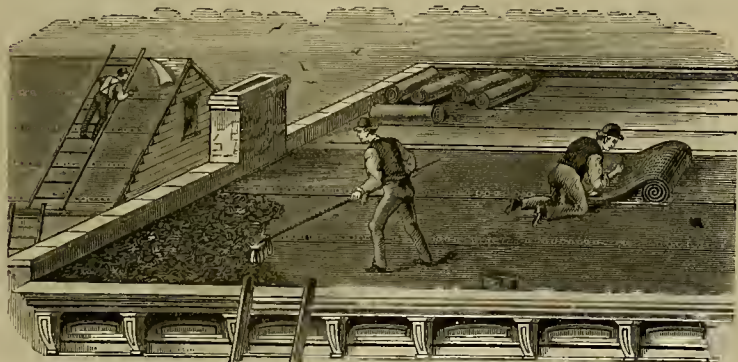
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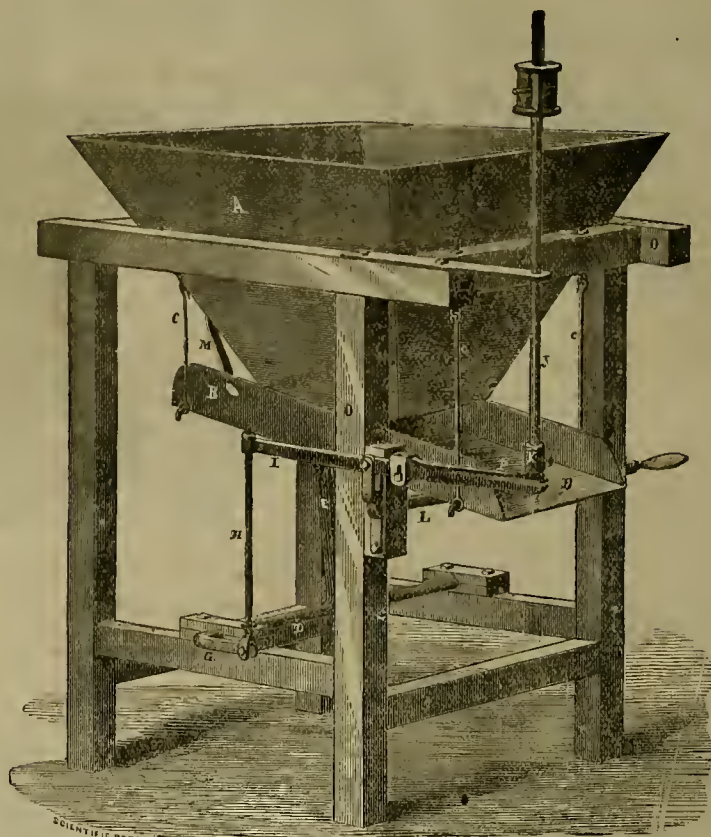
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We append a few extracts from the many testimonials which we have received from mill men and practical mining men, of the effectiveness and positive action of the Tulloch Feeder. We do not depend solely upon these testimonials, as we are aware that testimonials are easily secured for almost any machine, but the high character of the parties certifying to those herewith given, will establish their value and genuineness.

Mr. Jas. G. Fair has 28 in use; says: I regard them superior to any Feeder with which I am acquainted; I consider no mill perfect without them. Mr. E. R. Burke, Summer mine, Kern county, has 16: They never get tired; no man living can feed a battery as well; they save us in labor alone \$48 a day. Mr. Green, of the Phoenix mill (12), Amador, writes: The first machine we had is working away; is as good as ever; have not spent a dime on it; in use 14 months; you need fear no competition on wet ores. Mr. W. H. Armstrong, of Consolidated Virginia mill: We are running 60 stamps with your Feeders; they give unbounded satisfaction; they have not cost the company one dollar since starting up. Mr. H. C. Bidwell, Supt. Green Mountain and Gold Strike companies, Plumas county, writes: From the start they have done splendidly; no trouble whatever; requiring but little attention; a boy can manage them; the saving in both labor and castings is fully one-half over the old style of feeding by hand. Mr. Preston writes: I have four of your Automatic Self Feeders, and my mill men each and all say they are the best they have ever used. They are an improvement on all I have ever seen, being simple in construction, and good for either wet or dry crushing; refer to over 40 mills using them; they are guaranteed to give perfect satisfaction. Send for circulars.

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BY DEWEY & CO.,  
Patent Solicitors.

SAN FRANCISCO, SATURDAY, SEPTEMBER 1, 1877.

VOLUME XXXV.  
Number 9.

## Bridge Construction.

The subject of bridge building has of late received a great deal of attention, not only from engineers who have to design bridges, but also from the general public who use them. This is as it should be. Certainly structures which bear such precious burdens of human beings and valuable property as bridges do, should be constructed with all the safeguards made known by experience and the study of the strength of materials.

With a view to extending knowledge on this important subject, we have had the accompanying cuts made by our engraver from drawings kindly loaned to us by the Pacific Bridge Company, of this city. It is claimed that the Sprague & Patterson Howe truss combination bridge possesses the qualities of lightness and cheapness to the greatest degree consistent with safety and durability, the rule in its construction being to use a factor of safety of five; or, in other words, to make the bridge strong enough to bear five times the weight which is likely to be put upon it.

The pedestal, which is shown in detail, receives the ends of the main braces, and supports the strain of the bridge. It, in turn, rests upon rollers, which play in a groove in an iron plate, thus allowing for the expansion and contraction of the bridge under changes of temperature. For a bridge of 150-ft. span and 16-ft. roadway, using Oregon pine, the main braces at the ends of the bridge measure 8x10 inches; the second, 7x9 inches; third, 7x7 inches; fourth, 6x7 inches; and so on, decreasing in size toward the center. The counter braces are all 4x8 inches; floor timbers, 6x14 inches; joists, 3x12 inches; flooring, 3 or 4 inches thick; bulkhead, 2x12 inches.

The top chords are composed of two pieces 6x12, and one piece 8x12; packing 22 inches wide, keyed and bolted by four 3-inch bolts in each panel. Great care is taken that wood shall not abut against wood in such a way as to hold water and promote decay. The top chord, when finished, is covered from the weather, as shown in the small cut, but this does not interfere with the adjustment of the bridge in all of its parts at any time. All the joints of iron are made of cast-iron angle blocks, and thoroughly painted to protect them from rust. The suspension rods, two in number on each side of each panel, as shown in the cut of the lower connection, vary in diameter from one inch at the center of the bridge to two inches on the end panel. The lateral rods, running diagonally from side to side under the floor, are 3/4 of an inch in diameter. Owing to the peculiar manner of attaching the floor beams, the lateral rods can be extended to the outside of the chord, thereby increasing their length about four feet, and giving greatly increased resistance to lateral motion.

The lower-chord bars on each side vary from four bars four inches by three-quarters in the center panel, to two bars four inches by one-half in the end panel.

Any of the braces can be removed and replaced without stopping travel on the bridge. If repairs are needed on the abutments, two men can prepare the bridge for such work in half a day.

Two 12x12 timbers are placed perpendicularly

under the first set of floor timbers from the end; the nuts on the suspension bars are loosened, letting the weight of the bridge fall upon the second pair of braces and the temporary supports above referred to. The main braces and first panel can then be removed, the lower chords of that panel turned up out of the way, and abundant room gained for the use of a pile-driver, if necessary.

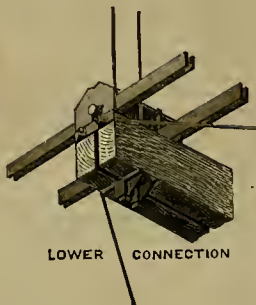
In a bridge of 150-ft. span the panels are 15



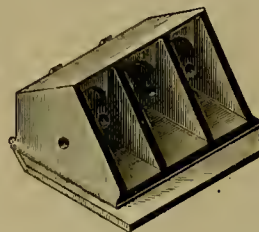
CHORD COVERING



ANGLE BLOCK



LOWER CONNECTION



PEDESTAL

feet long. As our limited space enables us to give only a few panels, while maintaining the size sufficiently to show the details of construction, our cut does not give a true idea of the fine proportions of the structure.

The above description will apply, in the main, to a bridge erected in 1876 for the Supervisors of Mendocino county, on the stage road from Ukiah to Cloverdale, where Russian river is

PERSONAL.—Mr. George H. Strong, of the firm of Dewey & Co., starts Thursday morning on a visit to the Eastern States. He goes as one of the California team of rifleman, who will contend for the honor of the State at the coming Creedmoor contest. It is over 20 years since Mr. S. left his home in Northampton and came to this State, and, because of close attention to business, has made but one Eastern visit during that time. He has been actively engaged in the

## Mining Accidents.

Mining accidents seem, by some strange fatality, to occur periodically, several at a time, and then we will hear of none for weeks at a time. The past week has been a singularly unfortunate one in this respect, a number of serious accidents having happened. The most disastrous was at the Belcher mine last Friday, in the bottom of the incline of the air shaft. A shift of four men was working in the bottom, engaged in sinking. The men were using a Burleigh drill, and had just commenced to put in a hole, when an explosion occurred. The names of the men in the incline at the time are Pat. Sullivan, Sam Barrett, Billy Hancock and Johnny Uglo. Barrett and Uglo were handling the drill at the time of the explosion, and being much nearer the face of the workings, were more seriously injured. The men were got out as soon as possible through the old Belcher shaft, and were carried by the other miners to the office dressing room, where their wounds were attended to. The *News* says the explosion was undoubtedly caused by the drill striking a giant powder cartridge which had failed to go off at the proper time. This is the only explanation that can be given, and is the true one, in the opinion of Foreman Marshal, as the men had no powder with them. Great care is always used to prevent any such occurrence as the one we have just recorded, but it is sometimes impossible to tell whether a blast has exploded or not. All the men engaged in this work are experienced miners. It cannot be said that the accident was the result of carelessness or ignorance. It is one of those occurrences that cannot be avoided, and against which human skill and knowledge cannot provide.

The coroner's jury, after hearing all the evidence, were unanimously of the opinion that the deceased came to death from the accidental discharge of a blast of giant powder in the incline of the Belcher mine, and that, under the circumstances no blame could be attached to any one. Both Barrett and Uglo are dead, and there are little hopes of the recovery of Sullivan.

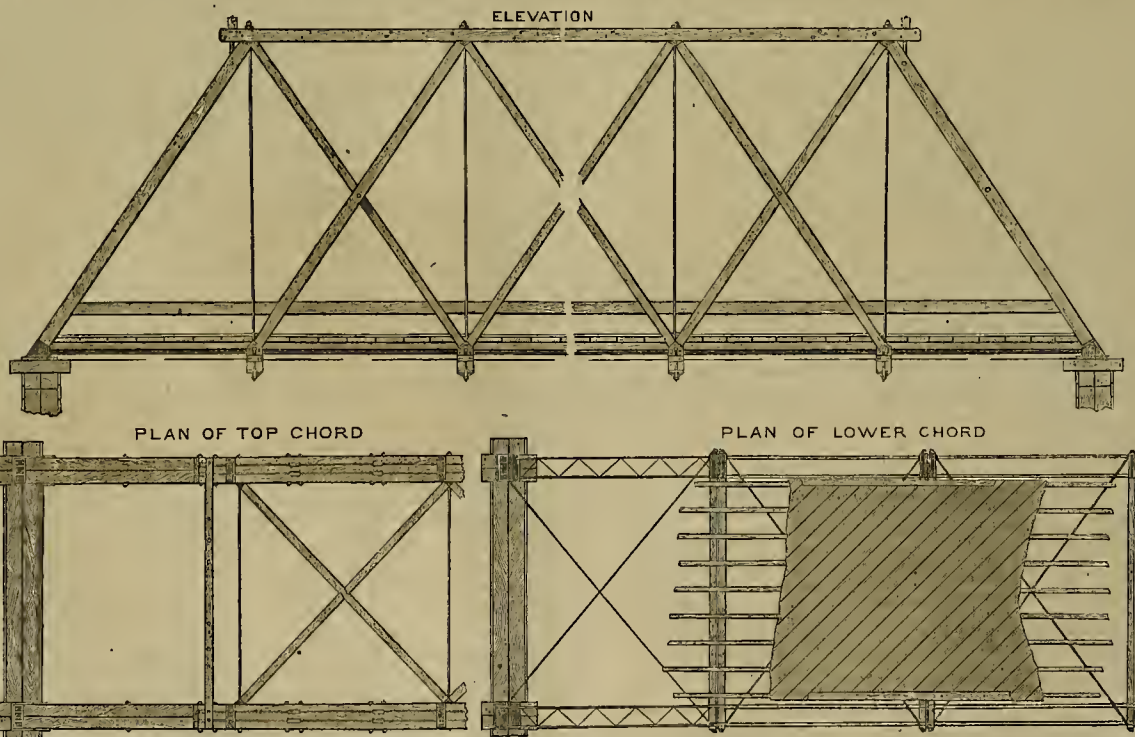
Robert Hoar was badly bruised by a cave in the Paymaster mine at Ward, last week.

On Tuesday, Hugh Halligan, a miner, was injured by a blast in the 1600-foot level of the California mine. His injuries will probably not prove fatal, but he was badly peppered with quartz splinters all over his body, and completely covered with flesh wounds.

On Saturday, Samuel B. Banton was caught in the pan shaft of the Petaluma mill, and instantly killed. It seems that Banton was reaching over the shaft; that works the amalgamating pans, when his jumper and shirt got caught by

two set screws on the collar of the shaft. By some means his left foot got entangled in a pulley, and held him fast to the shaft, which was revolving at the rate of 160 revolutions a minute. His head hung downward, and kept striking against the large pulley of the main shaft, which is perhaps five feet below the shaft that works the pans. His death must have been instantaneous.

David Hemming, while doing some work in the Pioneer mine, Amador county, was caved on, last week, and had his hip and knee dislocated, and the end of his thigh bone fractured.



DETAILS OF BRIDGE BUILT BY THE PACIFIC BRIDGE COMPANY.

crossed at Long's ranch. As in that case redwood was used, in place of Oregon pine, the timbers were made somewhat larger. A similar bridge of 128-ft. span was built for Sonoma county over the same river at Pine Flat.

The *Virginia Enterprise* says that a man at Silver City has found a gold mine that has so much free gold in the croppings that he can't get it out himself. He wouldn't have said anything about his find had he not desired the assistance of capital in taking out and sacking up the gold.

invigorated for future effective work in his specialty.

The old Eureka mine paid its 78th and last dividend of \$2 per share, aggregating \$40,000, on the 23d ult. The present company was organized September, 1866, and up to the date of its last annual report, October, 1876, had taken from the mine \$4,480,000, and paid dividends to the amount of \$2,054,000. Since that date one dividend of \$40,000 has been paid, and with the one paid on the 23d, will aggregate a total of dividends of \$2,134,000.



## CORRESPONDENCE.

### Lake Tahoe, the Loch Lomond of California—Its Character—Its Uses.

(Written for the Press by J. W. A. WRIGHT.)

My work for the PRESS in parts of Nevada and Placer counties has recently taken me to that truly splendid body of fresh water, known now as Lake Tahoe, and formerly as Lake Bigler. Perhaps a sketch may be acceptable to your numerous readers, giving some features and interests of that "Big Water"—as the Indian name is admitted to mean—and its prospects, much discussed of late, as a source of unfailing supply of water for at least two of the chief cities, and some of the richest mining regions of California.

Pleasant personal experience has proved to me that Lake Tahoe may, with truth, be called the Loch Lomond of California.

#### Loch Lomond.

April 20th, 1876—a day of bright sunshine, varied by a light shower from a few fleecy clouds which floated quietly by—some 80 or more delegates of the Co-operative Congress of Great Britain, who, for three days previous, at Glasgow, Scotland, had worked hard in their eighth busy and useful session, enjoyed a steam-boat excursion on that most noted of the Scottish lakes, the writer of this sketch accompanying them, by kind invitation, as their guest. On an early morning train we went over that most picturesque route from Glasgow to Balloch, 20 miles. Thence a cosy, Clyde-built steamer bore us over the lake to Rowardennan, at the base of old Ben Lomond—Scotland's most celebrated mountain peak—whose summit, then clad with snow, is reached from this place by a walk or ride of four miles. We next went to Inversnaid, the farthest point on the lake, opposite Balloch, and 21 miles distant. Half way between Rowardennan and Inversnaid we saw distinctly, in that clear atmosphere, "Rob Roy's prison," a rocky cave, of universal interest to tourists. Near Inversnaid are some beautiful falls noted as the scene of Wordsworth's charming poem—"The Highland Girl."

Our truly social party, having enjoyed to the full the wild beauty of these scenes with their pleasing associations in history, poetry, romance, and the novelty of the occasion itself, shared a well-spread lunch and after-dinner speeches, and reached Balloch, on our return trip, before nightfall. The scenes and faces of new friends, made familiar that day, will remain photographed forever on the memory of at least one of that party of co-operators.

#### Lake Tahoe.

July 4th, 1877.—To enjoy a quiet, cool, calm, restful celebration of our national birthday—business having brought me near one of the most fascinating and picturesque regions of our "New World"—after helping to "celebrate" at Placerville, in '75, by a hard but pleasant day's work, and after sharing with many thousands the grand but decidedly heated enjoyment of the World's Celebration, last year, in and around Independence square, Philadelphia, this thought was uppermost.

Is there any happier, better way for one to keep the day which every lover of liberty should always cherish, than to take an uneventful sail on the placid waters of Lake Tahoe, peering into its deep, blue waters; basking in its bright sunshine; breathing its pure, light, invigorating air; gazing at a hundred distant, towering mountain peaks; the whole day long drinking in, until it should become, as it were, a part of one's being, the true grandeur and beauty of its varied, odd, enchanting, almost mysterious scenery and surroundings—thus living, for a day at least, in seclusion from the busy world of action, and in converse with the domains of Nature?

Soon after sunrise, on this Fourth, a stage load of us, animated by some such thoughts, and bent on recreation, left Truckee, the nearest point on the Central Pacific railroad, some 14 miles from either Tahoe City or Hot Springs, on the shores of the lake. Rapidly we made our way up the wild valley of Truckee river to the former place, where this river, so noted for its clear, dashing waters and unsurpassed trout and trout fishing, forms the only outlet of that vast body of fresh water, which nestles among the Sierra Nevada at a height of more than 6,000 feet above the level of the Pacific ocean. By 9 a. m. some 15 or 20 passengers boarded the pleasure *Gor. Stanford*, and, with flags gaily flying, the tour around the lake and observations began, which are the occasion of the present description and items.

Between 5 and 6 p. m. this

#### Inland Voyage

Around and across the lake was completed by touching at or passing the following points in succession from Tahoe City on the north shore back to the same place, going from west to east: First, eight miles out, McKinney's, on the western shore; second, 10 miles further, Emerald bay, passing, on the way, Sugar Pine Point and Rubicon Point; third, four miles to a point familiarly called Yank's, though its name, as a post-office, is Tellac; fourth, four miles again

to Rowland's, which, with the preceding landing, is on the southern shore of the lake and in the lower part of Lake valley, a fine grazing and hunting region, extending back some 14 miles and as much as six miles wide in places; fifth, 14 miles to Glenbrook, an important lumber town, about 16 miles from Carson City—the capital of Nevada, our silver State—and connected with it by stage; thence 22 miles directly across the lake to Tahoe City again. This round trip being completed, the little steamer finished its day's work by a run of 12 miles to Hot Springs, or, as it is sometimes called,

#### Carnelian Warm Springs.

Where it lies at a good wharf for the night, ready to start on its daily round at 7 o'clock next morning. This affords an opportunity, for those who wish it, to stop over night or longer at one of the most noted and, in every way, most pleasant places of resort on the lake, where Mr. Wm. B. Campbell, the proprietor, furnishes the best of quarters, fare, fish, boats and fishing tackle. The warm baths, cooled down from the natural temperature of his noted sulphur springs, which give the name to his place, are truly luxurious, refreshing and healthful, and cannot be had anywhere else around the lake, though there is a soda spring near Tellac. The natural temperature of one of these springs is about 120°, another 200° Fahr. On the way to this most attractive resort, you pass Observatory Point, where Mr. Lick once proposed to place his great telescope; and farther in, to the left, are Carnelian and Agate bays, so called from the small and sometimes very beautiful

#### Specimens of Chalcedony

Found along the beach in large quantities, especially after heavy wind storms. Near Hot Springs is Boundary Point, over which the line between Nevada and California passes, marked here by one monument of granite, another of iron. Those who can spare a week or more, should, by all means, divide their time between this place and the others mentioned, for each point has its specialties and attractions. Mr. Bailey, at Tahoe City; Mr. Clement, at Yanks, and Mr. Rowland, at his place, do everything in their power to secure the comfort and enjoyment of their guests. A stage runs between Hot Springs and Truckee. The fares and charges about the lake are not exorbitant, when we consider the short season and difficult transportation at an altitude of nearly a mile and a quarter above the sea.

The Fourth of July excursion in question was thoroughly enjoyed by all who shared it, coming fully up to expectation, with a few additions. By mid-day some clouds gathered rather ominously and a brisk breeze sprang up, so that when the steamer left Glenbrook, we experienced, on a small scale, some of those bewitching "chop-seas," for which the Straits of Dover and San Francisco bay are noted at times. The boat being small, the passengers soon found that they needed all the "sea-legs" and sea-digestion they could command. Some of our number having but a small stock of either, it was not long before the aforesaid, "peering into the deep, blue waters," was accompanied by slight convulsions and nphaevals—not, however, so destructive to life or lasting in their effects as those geological ones which placed the Sierras where they are, and made for Lake Tahoe its place in nature. Under such circumstances, it is distressing to hear a man exclaim, "Oh! my conscience!"—as if his conscience hurt him—while he rushes to the side of the boat and hangs resignedly over the railing. But, fortunately, on this lake it is not long before his conscience is clear again, and he is none the worse for it.

#### Lakes Tahoe and Lomond Compared.

With the scenery of Loch Lomond fresh in memory, your correspondent could but be impressed at once with many points of similarity in Lake Tahoe. The general outlines of the shores, the contours and arrangement of surrounding mountains and several other objects of interest are wonderfully alike.

There are the same bare granite mountain sides and peaks, overspread in places with similar patches of snow. Tahoe is, perhaps, the more heavily timbered near its shores. Lomond is 21 miles long; Tahoe 22, though the latter has some advantage in width, varying from 10 to 15 miles. Tahoe City is the Balloch; Yank's or Rowland's, the Rowardennan; Mount Tellac, the Ben Lomond; Glenbrook, the Inversnaid; and the Cavern, in Cave rock, is the Rob Roy's prison, of Lake Tahoe. These points all follow in the same order, and correspond very well in distances. From Yank's or Rowland's you make the ascent of Mount Tellac, some 3,400 feet above the lake, and from its dizzy height have one of the finest views on our continent, comprising 36 lakes in sight.

From Rowardennan you ascend Ben Lomond, 3,192 feet high, and from its summit have one of the finest views in Europe, including many lakes, or lochs, as our Scotch friends would call them. From Lake Tahoe, a beautiful stream flows into Emerald bay, forming a fine waterfall some 250 feet high, which, though not coming in the same order, supplies the place of the falls near Inversnaid. As the steamer passes the mouth of Emerald bay, you distinctly see the crystal water of these falls, several miles away, glistening in the sunlight, the whole effect of the scene being one of entrancing beauty.

Other points of similarity, are the same transparency of atmosphere, and the wonderful clearness of the waters of each lake, the bottom near the shore and bright objects and fish being distinctly seen at depths

of 40 and 50 feet, or even more, when the water is perfectly calm. The waters of Tahoe never become at all muddy, which I believe is also true of Loch Lomond.

With but little effort of imagination, then, we can see in Lake Tahoe a counterpart of Scotland's famous lake.

#### Other Points of Interest.

The depth of Tahoe is very great. Until recently no deeper sounding had been made than some 1,600 feet, but Capt. Lapham, commanding our steamer, informed us that Prof. Le Conte's deepest sounding gave the immense depth of 2,700 feet, off Rubicon Point, a bold, precipitous cliff. It seems strange that, as your boat passes over such a vast expanse of water, you may draw a bucket full from any point, and the water is perfectly clear and pure and deliciously cool. Dr. Blake recently showed, in a paper read before the San Francisco Academy of Sciences, that its surface temperature is 62°, while at a depth of 560 feet it is about 39°. The air is delightfully cool most of the 24 hours, the mercury indicating 76° as usually the highest in July. The winters are often severely cold, but the lake never freezes, though the whole surrounding country is covered with deep snow. It is a remarkable fact, whatever may be the cause, that the bodies of persons drowned there—and quite a number of such instances have occurred—have never been found. This is supposed to account in part for the superstitious awe with which the neighboring Indians regard this "Big Water." It is with the greatest difficulty that any of them can be persuaded to go upon the lake in any kind of boat. In a few instances, where they have been induced to go on board a steamboat, they have invariably thrown themselves on their faces and remained in that position till the voyage was ended. The reason they give for this terror is

#### An Indian Tradition.

That many, many moons ago, when their ancestors first came to that lake, many of them tried to cross on rafts and boats, and never were seen or heard of afterwards. To one looking out upon the usually placid surface of this grand lake, where a little steamer—or, occasionally, a schooner's white sails—may be seen once or twice a day, there is a mysterious silence, an impressive stillness and solitude, well calculated to inspire awe—a feature faithfully expressed in the accompanying engraving from the fine painting of Thomas Moran. His view is between Glenbrook and Rowland's, looking south and west. To the left of the boat, Cave rock is seen projecting slightly into the lake. The cavern, 100 feet or more above the lake, is only about 30 feet in depth. Near Glenbrook, Shakespeare rock gives an excellent profile of the great dramatist. There are in all four steamboats on the lake—the *Niagara*, a fast little propeller, being used for excursions in calm weather, and towing a large passenger barge called the *Palace*; also, two others employed in towing rafts of logs from different points to Glenbrook, where four saw mills turn out between 20,000,000 and 30,000,000 feet of lumber annually for Carson and Virginia City. A narrow-gauge railroad, eight miles long, takes the lumber to the summit of a ridge, 2,000 feet above the lake, whence it is conveyed, by a V-flume, 21 miles to Carson, 4,000 feet lower than said summit. The color of this mass of extremely pure water of Lake Tahoe is one of its most striking features. It varies from an indigo-blue, when very deep, to a light green, where it is shallow. The line dividing these colors is marked with wonderful distinctness as you leave Rowland's to go north. You see it from quite a distance, and pass, all at once, from the green to the blue, so sudden is the change to the deepest water.

#### Animal Life.

The scarcity of water fowl was surprising. Only two or three white gulls were seen on the eastern shore. Not a duck or wild goose or swan appeared; not a grebe, or "mud-hen," such as those that abound on Owen's lake. None of the queer worms are found which I described, in a former paper, as so plentiful in the surf of the latter lake. At least four, possibly six, kinds of fish abound in Lake Tahoe—the silver trout, black trout, white fish, a sucker, a chub, and a minnow, used for bait, the latter probably differing as much from the larger kinds as the brook minnow does from other fish in our streams. A harmless spotted water-snake is quite plentiful, but no venomous reptiles have been found in or near the lake.

Mention has already been made of

#### The Carnelians.

Found only along the bay of that name and Agate bay. A curious opinion prevails with some of the old settlers as to the formation of these very pretty minerals, as there found. It may be worth recording and thinking of, whether the theory is correct or not. It is, that these carnelians are a species of fossil resin from the pines around the lake, just as the amber, tossed upon the shores of the Baltic, is known to be of resinous origin, as is proved by the insects sometimes imbedded within it. The idea is, to say the least; ingenious and may deserve further investigation. Our party certainly found pieces of resin still soft which were washed up with the hard carnelians, while some of the latter, hard as any pebble, had very much the shape and appearance of fossilized resin, but we looked in vain for imbedded insects. However this may be in regard to some of these so-called carnelians, there is hardly a doubt that many, if not all of them, are a very pure form

of the well-known mineral, chalcedony.

#### Prospective Uses of Tahoe Water.

It remains to discuss briefly the future value of Lake Tahoe for certain city and mining interests of California.

Could a feasible plan—say Col. Von Schmidt's or any other—be worked out without extravagant outlay, without more watering of stock than the lake water itself would do, without any of those notorious tricks in management which have given our people in town and country a mortal dread of moneyed corporations, and almost totally destroyed their confidence in all enterprises where a large fund is required—so that this inexhaustible source of some of the purest water in the world, literally fed by eternal snows, could hereafter supply the wants of San Francisco, Oakland, Sacramento, and the gravel mines of a large part of Placer county, it would indeed be a God-send to millions of the future population of the Golden State.

Those interested in the fullest prosperity of California cannot examine the extent of Lake Tahoe and enjoy the refreshing draughts of its splendid water, without wishing this result could be consummated at the earliest possible date. Who can doubt, that by the end of this century, less than 23 years hence, the first two cities named will (combined at least) have half a million people with their varied wants to supply, while Sacramento will have grown greatly, and other places in proportion. Recent visits to the mining regions of Placer county have shown me that its two great "divides" of Forest Hill and Iowa Hill, extending up as high as Michigan Bluff, Sunny South, and Last Chance, perhaps even higher, comprise some of the richest deposits of gold in the State, to say nothing of the other valuable minerals, including the finest asbestos. One can but be impressed with the belief, after examining the mining prospects of this and Nevada county, and other mining districts of the Sierras, that a thousand years from this, California will still be furnishing the precious metals and others in abundance, if its people need them in those days. But the pressing want to develop these valuable resources, is just what the interests of agriculture and temperance need in our State, viz.,

#### Plenty of Water.

An examination of the many valuable hydraulic mines around the places named, also about Todd's Valley, Bath, Smith's Point, Yankee Jim's, Damascus, and other places lately prospected, proves how lamentable are the effects of the absence of water, such a dry year as this has been. To my surprise, I find that many have not had enough water to work their mines more than two weeks, others only about a month altogether, the past season. All these points are but 3,000 or 4,000 feet above the sea level, so that the fall from the lake is ample, when the necessary tunnel is once made. Why cannot the interests of our larger cities, and these rich mining districts, and some of our agricultural interests along the route, be judiciously combined, and so managed as to furnish all these wants with an inexhaustible supply of the best of water for all these purposes? Shall the fear of "crooked" management prevent? Must we have the humiliation to admit that, with all our boasted institutions, good laws, the sagacity, inventive genius, and integrity of our people, we cannot have such legislation and control as will work out any such enterprise for our people, or our Government, to a successful and honest result? For the sake of American honor, business tact, and statesmanship, we trust not.

#### Valuable Mines.

While the mass of mines in Placer need this supply of water, some, it is true, do not. Such are, the noted Weske mine, along El Dorado canyon; a new quartz lead, located by Mr. Durning and others, near Yankee Jim's; and, last but not least, Bell's rich and very wonderful mine of decomposed quartz, near Bald hill, four miles northwest of Auburn. The Weske mine is troubled, just now, with too much water. Their tunnel having been completed some 4,000 feet, this mine is remarkable, above all others, by having a steam engine in one of its large chambers, 3,800 feet under ground. It is used to pump out the surplus water.

The local newspaper reports of the rich yield of Mr. Bell's new mine, near Auburn, have by no means been exaggerated. It was discovered by him the latter part of February last by systematic prospecting and tracing, which it is interesting and instructive to hear him explain, while going over the ground. With his pan, he followed up the wagon ruts and small gullies in an old road after a winter's rain, till he found the outcropping rock from which the exceedingly rich deposits have been taken. It began to pay well from the surface. Early in June he had sunk his shaft 40 feet, and since March 1st had taken out somewhere between \$25,000 and \$35,000. This was done chiefly with pick and pan, a single panful of the decomposed rock yielding at times from \$1,000 to \$2,000. When I visited the mine, he was retimbering the shaft and preparing to go deeper. Descending the shaft with him, I saw him take out a panful of rock and clay from the side of the shaft, some 35 feet down, where the ledge is nearly four feet wide. I saw him wash out this panful with no extra care, and when he finished, the result of about 10 minutes' work was some \$25 or \$30 in coarse gold, several lumps of which were worth \$2 or \$3 each. Most of this gold is very pure and of laminated form, the intervals between the folds being often filled by a sub-

Continued on page 134



## MECHANICAL PROGRESS.

## A Cotton-Picking Machine.

If the complex operations needed in cotton picking are successfully performed by mechanism, it would seem that the inventor need shrink from no problem. According to *Legg's Milling News*, the cotton picker has been patented and the following gives an idea of the machine and its task: Cotton plants vary in height from one foot to seven, and are planted in rows at various distances apart, but averaging about three and a half feet. The pods mature at varying times, and when they open, the cotton gradually unfolds itself and hangs down more and more, until, if not picked, it is finally shaken out by the wind, and falls on the ground. The picking season extends usually from the latter part of August to the first of December. From the knowledge of these facts some idea can be formed of the difficulties to be overcome before cotton can be successfully picked by machinery.

We now learn that an apparatus has been constructed and experimented with which promises to fulfill the requisite conditions. It is the invention of Mr. O. R. Smith, of Raleigh, N. C., and was patented April 10th, 1877. It consists of a frame, mounted on three wheels, and spanning two rows of plants, the single front wheel running between the rows, the rear wheels outside. The rear wheels are quite large, so as to carry the framework over the highest plants; the front wheel is much smaller, and works under the machine on a pivot joint, to which the horses are attached.

The picking is done by a series of flexible rubber rods, boarded with fine spines pointing upward, which work alternately up and down through the plants as the machine advances. These rods are fastened to levers, which vibrate alternately, so that as one rod is moving up the next is going down. The cotton adheres to the spines, and is stripped from the bolls on the up-stroke; and on the down-stroke the adjacent rods pick off the cotton from the spines and carry it upward until it is removed at the top by brushes, as from the saws of the cotton gin. An endless apron then carries it into a receptacle at the rear, from which it is removed when sufficient has collected.

These picker rods—of which there are about 200—are just sufficiently flexible to clear themselves from stalks or stumps, and do not, it is stated, injure the plants. The spines with which they are covered will not take hold of leaves or twigs, as nothing but the cotton will adhere to them, and they pick all that is opened, whether on the ground or at the top of the plant. The machine costs \$300, and is estimated to pick the cotton at an expense of one dollar per bale, a great saving over hand labor.

**MACHINE BELTING.**—A specimen of gigantic machine belting, produced from the skin of the walrus or sea-horse, has recently been exhibited in London by the manufacturer, and excited much attention and interest. It is stated, in fact, says the *American Manufacturer*, that this belting cannot be equalled by any yet introduced for strength and durability in case of heavy work, when used upon large drums, such as main driving, and similar requirements. The thickness of the walrus hide is from one-half to one and a quarter inch, so that belts of such substance can be made of solid leather; and the fibers thereof being longer than any other hide used in the making, it presents the valuable advantage of being remarkably tough, and consequently very lasting. The employment of this material in the way named is, of course, not a new resort, but its importance has been only slightly realized. It is well known that, in ordinary double belting, a great strain takes place on the outside lap of the belt, which, of course, owing, of course, to its being of one thickness only; cannot be the case with the walrus-hide belt, it is remarked, moreover, that they run very slack, and do not require to be worked very tight, as some belts do. Indeed, such is the light on the drum, that a 14-inch belt, 90 feet long, will drive 100 horse power with ease.

**A BATHING CAR.**—An exchange says: "The Turkish bath will be introduced on railroad trains. Charles H. Cooper, of Watertown, N. Y., has patented a car for this purpose. The internal arrangement is a parlor or drawing-room, 10 by 15 feet; Russian and plunge bath, 8 by 7½; three shampooing rooms, 6 by 7½; tepidarium, 10 by 23; movable closets, 2½ by 10; passages 18 inches wide. The temperature in the various rooms will vary from 80° to 160°. The whole is lighted by blue glass. The idea of the inventor is that the car may be used on trains or side-tracked at towns where no such establishments are in operation. The entire process of the Turkish bath is to be practiced—from the hot room to the shower bath, plunge and cooling down."

**MUSICAL MACHINERY.**—The average annual value of musical instruments made in Paris during the last six years has been 23,000,000*f.*, divided among 360 makers, employing no fewer than 5,000 workmen. Paris turns out every year 1,320,000 francs' worth of accordions. Pianos figure for 11,400,000*f.*; organs for nearly 5,500,000*f.*; wind, wood, and metal instruments for nearly 4,000,000*f.*; but bowed instruments for less than 500,000*f.*

**FIRING UNDER WATER.**—Major-General Von Uchatius, the inventor of the new field gun adopted in the Austrian army, has made some interesting experiments with the object of ascertaining the effect produced by firing a rifle under water. It is known, he says, that fishes, when they are not too much below the surface of the water, can be shot from the shore or from a boat. The armor-plates of ships of war, however, do not usually extend any lower than from two to three meters below the surface, as beyond that depth ships are regarded as unsalvageable even by the largest shot. This is so, no doubt, when the shot is fired above water; but Major-General Von Uchatius wished to find the result which would be attained by firing under water; for this purpose he procured a wooden raft, to the under surface of which a Werndl rifle was attached with iron clamps in such a manner that when the raft floated on the water the rifle was fired horizontally at a depth of half a meter below the surface. An attendant then opened the lock, introduced a cartridge, placed the rifle at full-cock, and fired it from the shore by means of a string attached to the trigger. The target consisted of a wooden board an inch thick. The result of the experiment was as follows: There was no difficulty in loading and firing the rifle, and there was the advantage that after each shot the inside of the barrel was cleaned by the water. About thirty shots were fired without doing the smallest damage to any part of the rifle. At each shot there was a dull sound, which could not be heard beyond a distance of fifty paces, and bubbles of smoke rose above the surface. At a distance of one and a half meters no impression whatever was produced on the target; at one and a quarter meters the bullet entered to a depth of from three to four millimeters, and at one meter the target was pierced through.

**THE PERILS OF THE FOUNDRY.**—Few appreciate the dangers which the brave mechanics face, or give them proper credit for bravery. We read of an accident in Pittsburg, Pa., which was as follows: A number of men were casting a chilled roll. Nearly two tons of iron were required to make the casting, and the services of 20 men were required to handle it. While they were pouring the molten metal into the mold there was a sudden and terrific report, which was closely followed by a shower of liquid iron. The red-hot metal flew in every direction and dropped upon and about the workmen. They ran to escape the shower, in their terror dropping the ladle which yet contained most of the metal. The ladle was overturned and immediately great streams shot out in quick pursuit of the flying laborers. Two of the workmen, closely followed by streams of the red-hot iron, fell into adjoining pits and the metal ran in upon them, burning their flesh to a crisp in many places. One man's face was burned to a crisp and his eyes burnt out of his head, and in their places the sockets were filled with chunks of chilled metal. That man was George L. Elbert, of Allegheny. Walter Mbran's eyes, too, were burnt from the sockets, and his face, breast, arms and hands were burnt to a crisp at different places. Here and there the red-hot metal had actually eaten its way to his bones. Mr. Totten was interrogated as to the cause of the explosion, and he attributed it to a "damp cave." In other words, the sand with which the mold had been packed was not properly dried, and perhaps, too, not properly grooved, so that the steam generated could not escape.

**AN IMMENSE CONTRACT.**—We read in the *Polytechnic Review* that the largest single contract ever taken in this country from a foreign nation is the \$17,000,000 one given to the Providence Tool Company by the Turkish Government. The Tool Company was three years in preparing to begin the work upon the contract, and now employ 2,500 men, who turn out 200,000 guns per year, or 600 finished guns in a day. These guns are the Martini Henry rifles. One of the side businesses of magnitude which has grown principally out of this contract is that of the Excelsior Box Company, of Providence, of which James A. L. Amoreux, of this city and South Hadley Falls, is treasurer. The Excelsior Box Company is now busy making 20,000 boxes per year for the Tool Company, in which to ship their guns to Turkey. Each box is made to hold 20 of the guns, and with such accuracy are the groove pieces for the interior of the boxes made, that they do not allow a play of even 1-200 part of an inch of the arms, when packed with the muzzle-tip and shoulder-piece resting in the grooves. No other precaution is needed or used in packing the guns for shipment to Turkey. The machinery for the manufacture of these boxes was perfected in an invention for the purpose. The company has still two years in which to complete the number of these boxes that they contracted to make; by which time, also, the Tool Company will have completed their immense contract with the Turkish Government.

**CASTING BABBIT BEARINGS.**—The Keystone Portable Forge Co. kindly gives the *Polytechnic* some points relative to its successful practice with Babbitt metal bearings. The first usage was to run the bearing on a highly finished steel mandrel of the exact size of the shaft, and then to ram the bearing out a trifle to make a running fit. The present and improved practice is to run the box on a mandrel a size larger than the shaft, and not to ram. By this means the skin of the Babbitt casting is not disturbed, and the bearing runs cooler and longer.

## SCIENTIFIC PROGRESS.

## Camping on the Pole.

Mention has before been made of Captain Howgate's project to establish a colony in the extreme regions of the north, and to maintain it until desirable facts are ascertained about the polar regions. This expedition was announced to sail from New London, Conn., a few days ago. The expedition is aboard the little schooner *Florence*, manned by ten seamen, under the command of Captain Tyson, who had the *Polaris* in charge when it was cast upon the ice drifts three years ago.

Captain Howgate, who originated this expedition and has managed the affairs of its preparation, is an officer of the Signal Corps of the army, second in command to General Meyers, "Old Probabilities." He has the immediate charge of the Signal Service, managing its details, while General Meyers has a general supervision. Captain Howgate is a man of middle age, quiet in his manners, and very modest. His whole life has been spent in science—meteorological science especially. For nearly four years he has been devoting his leisure to the study of the subject, and the scheme he has matured and projected is to found a colony at the most accessible point in the Arctic regions, which may be the base of supplies, and the center of a grand system of exploration. He proposes to establish a colony where the men engaged in the work can acclimate themselves by actual residence to the hardships of Arctic life; from which they can penetrate the ice wilderness by easy stages, and to which they can retreat when they become disabled or their supplies give out. In this scheme he has received the encouragement of the entire scientific world, but has had to face many discouragements and difficulties in bringing it into practical operation.

Last year he had his plans fully formed, and asked of Congress an appropriation of \$50,000 to carry it into effect. The Naval Committee recommended it unanimously, but the attention of Congress was so engrossed by the matter was neglected. After the adjournment of Congress he appealed to individuals, and a subscription of \$10,000 was raised for him with which to start out a vessel to take the preliminary steps. Accompanying Captain Tyson, in addition to his crew of ten experienced men, are Mr. O. T. Sherman, of Providence, R. I., who goes as meteorologist and photographer. The Smithsonian Institute is represented by Mr. Ludwig Kumlien, who goes as naturalist and geologist. The expedition is furnished with all of the scientific instruments required. Different vehicles of locomotion are provided for overcoming the distance between the colony and the pole, and great confidence is placed in a combined raft and sledge which has recently been invented by Commodore Ammen, of the Navy Department.

The instructions of Captain Tyson are to erect comfortable quarters at the most feasible location, for which he has the timber all ready to be put together, choosing a point that will be easily accessible to vessels from the south, and also favorable to exploring trips to the north. He will employ a number of Esquimaux, a full supply of dogs, native sledges, and a quantity of fur clothing, such as the inhabitants of the region wear. During the summer the *Florence* will get in a cargo of bone and oil for a winter's supply, and will then return to this country, leaving the scientists encamped in the colony. By the time of her return Captain Howgate hopes to secure an appropriation from Congress with which he can equip a larger force to go as reinforcements to the colony under his personal command next summer. In the meantime the colonists will become hardened to the climate, and make such explorations as they are able.

## The Geology of British Columbia.

We notice that the geology of our northern neighbor was discussed, at a late meeting of the London Geological Society, by George Mercer Dawson, Esq., F. G. S., Assoc. R. M. S., of the Geological Survey of Canada. The author stated that the rock-striation and fluting on the southeastern peninsula of Vancouver's island shows that at one time a great glacier swept over it from north to south, filling the Strait of Georgia, 50 miles broad in places, and having near Victoria a thickness of ice of over 600 feet. Traces of this glacier also occur on San Juan island, and on the coast of the mainland. The deposits immediately overlying the glaciated rocks, besides what may be *moraine profonde*, locally developed, are sandy clays and sands, arranged in water, and sometimes containing marine shells. The lower beds, at least, of these, were probably formed at the foot of the retreating glacier, the sea standing considerably higher than at present. The northern part of the Strait of Georgia and fjords opening into it, and the fjords north of the strait, show ice-action to a height of above 3,000 feet. Terraces on the coast of the mainland are rare, and never at great elevations. The interior plateau of British Columbia shows a system of glaciation from north to south, traces of which have been observed about 3,000 feet. Subsequent glaciation radiating from the mountains also occurs. The superficial deposits here

are either modified or unmodified. The former, representing the boulder clay, occurs at nearly all heights up to over 5,000 feet; the latter characterizes nearly all localities below 3,000 feet, and is most extensively developed in the northern low country, where it forms a white silt or loess. The interior is marked with shorelines and terraces up to 5,270 feet. Moraines occur in great numbers, most of them marking stages in the retreat of glaciers towards the mountains, although some have been found in connection with the north and south glaciation. The sequence of events in the interior, according to the author, seems to have been as follows: Glaciation from north to south, with deposits of boulder clay; formation of terraces by lowering of water surfaces, accompanied or followed by a warm period; advance of glaciers from the mountains, and formation of lower terraces; and retreat of glaciers to their present limits. The glaciation of Vancouver's island may have occurred during both cold periods or during the second only. The author considers the assumption of the production of the north to south glaciation by an ice-cap to be attended with great difficulties, and seems to favor the notion of its being effected by the accumulation of ice on the country itself, and especially on the mountains to the north, filling the central plateau in going southward, and passing seaward through the gaps and fjords on the coast range.

## The Origin of Petroleum.

At a recent meeting of the Chemical Society of St. Petersburg, Professor Mendelieff sought to combat some of the old notions on the origin of petroleum, and to substitute a new theory on the subject. It has been maintained by many geologists that the decomposition of mineral matter in the lower strata of the earth was the source of petroleum.

Mendelieff believes that the true source is to be found much lower down. The sandstone in which it is found were not its original source, as is shown from the fact that no carbonized animal remains are found in it. There ought also to be other products of animal decomposition, if that was the starting point; we must search lower down, even below the Silurian, as the mineral oil in the Caucasus is found in the Tertiary, and in Pennsylvania in the Devonian and Silurian. As, however, in the rocks below the Silurian there was very little organic life, the formation of such a great quantity of petroleum could scarcely be traced to such a limited source. Mendelieff therefore proposes a substitute for the organic theory. He goes back to the nebular hypothesis of Laplace, and applies Dalton's law of the original gaseous condition of the material of the earth, and, taking into consideration the density of the earth and the vapor density of the elements, he arrives at the conclusion that the interior contains many metals, and that chief among them is iron; finally, he assumes the presence of carburetic compounds of the metals, and comes to the following conclusions: Through some of the fissures in the crust of the earth, occasioned by the upheaval and depression of the surface, water percolated to the carbureted metals, and acted upon them at high temperature and elevated pressure, thus forming metallic oxides and saturated hydrocarbons; the latter rose in the form of vapor to the upper strata, where they condensed to liquids in porous sandstones and other rocks having a tendency to absorb liquids. The internal heat of the earth occasioned the reduction of carbureted metals, and this gave rise to hydrocarbons. Other chemists than Mendelieff have shown, experimentally, that something very like petroleum can be produced artificially by imitating in the laboratory the process above described.

**SPONTANEOUS PRODUCTION OF PROTOXIDE OF IRON.**—M. Terrell, who is at the head of the laboratory attached to the Paris Academy of Sciences, has investigated the oxidized crust which he found rapidly accumulating on the surface of the iron rods of the registers of a Siemens furnace. This furnace was of a new design. It might be supposed at first that this crust consists of magnetic iron oxide, but this substance forms really only a fourth, hardly that, of the total mass. The great bulk consists of the protoxide of iron recently discovered by M. Debray, protosulphide of iron being present in the proportion of about one per cent. M. Daubree remarks that this unexpected product, so far from being accidental, is quite normal, and occurs in spite of the strong clay lining of the rods, when they are plunged into a reducing atmosphere. The latter, according to M. Gigat, contain 64 parts nitrogen, 26 carbonic oxide, 16 hydrogen, and 4 carbonic acid. The thickness of the deposit is estimated at half a millimeter a day.

**NEW STANDARD LIGHT FOR GAS TESTING.**—In his Cantor lecture on the Chemistry of Gas Manufacture, Mr. A. Vernon Harcourt, M. A., F. R. S., stated that the standard sperm candle is uncertain, variable in composition and construction of wick, and that the mode of burning and light of the same candle fluctuates greatly from time to time. He proposes as a substitute for the standard candle an air-gas, obtained by saturating air with light petroleum vapor. The gas he obtains by passing air through water with a measure of light petroleum on its surface contained in a Woulfe's bottle. The gas is to be burned in a burner of definite size and construction, the gas issuing without pressure.



## Table of Highest and Lowest Sales in S. F. Stock Exchange.

Name of Company.	Week Ending Aug. 9.	Week Ending Aug. 16.	Week Ending Aug. 23.	Week Ending Aug. 30.
Alpha.....	11 1/2	10 1/2	11 1/2	10 1/2
Alta.....	2 7/8	2 1/2	2 1/2	2 1/2
Andes.....	80c	70c	60c	75c
Baltimore Con.....	40c	55c	55c	55c
Belcher.....	4 7/8	3 1/2	3 1/2	4 1/2
Best & Belcher.....	16 1/2	16 1/2	15 1/2	15 1/2
Bullion.....	8 1/2	8 1/2	8 1/2	8 1/2
California.....	4 05	3 65	3 85	3 70
Challenger.....	28	26 1/2	25	25 1/2
Chollar-Potosi.....	30	26	32	30 1/2
Confidence.....	4 1/2	4 1/2	4 1/2	4 1/2
Con Imperial.....	90c	85c	75c	85c
Con Virginia.....	30 1/2	28 1/2	27	27 1/2
Crown Point.....	4 05	4 10	4 10	3 95
Coso Con.....	10c	5c	10c	5c
Dayton.....	55c	52 1/2	51 1/2	51 1/2
Eureka Con.....	6 2 1/2	6 1/2	6 1/2	6 1/2
Eschschuer.....	6 2 1/2	6 1/2	6 1/2	6 1/2
Geddes & Bertrand.....	25c	25c	25c	25c
Gen Thomas.....	25c	25c	25c	25c
Grand Prize.....	65c	60c	60c	60c
Globe Con.....	35c	30c	30c	30c
Golden Chariot.....	35c	30c	30c	30c
Gould & Curry.....	9 1/2	8 1/2	8 1/2	8 1/2
Hale & Norcross.....	9 1/2	8 1/2	8 1/2	8 1/2
Hussey.....	30c	25c	40c	35c
Julia.....	1 60	1 15	1 35	1 70
Justice.....	10 1/2	9 1/2	9 1/2	9 1/2
Kentuck.....	5 1/2	4 1/2	4 1/2	4 1/2
Kentuck.....	4 1/2	4 1/2	4 1/2	4 1/2
Knickerbocker.....	10c	25c	15c	10c
Kosuth.....	95c	90c	85c	85c
Lady Bryan.....	2 1/2	1 95	1 95	1 80
Lady Wash.....	2 1/2	1 95	1 95	1 80
Leviathan.....	55c	50c	45c	35c
Leeds.....	90c	55c	55c	55c
Modoc.....	90c	55c	55c	55c
Manhattan.....	10 1/2	9 1/2	10 1/2	10 1/2
Mansfield.....	90c	75c	75c	75c
Meadow Valley.....	90c	75c	75c	75c
Mexican.....	95c	85c	85c	85c
North Con Virginia.....	30c	25c	25c	25c
New York.....	30c	25c	25c	25c
Northern Belle.....	18 1/2	18 1/2	18 1/2	18 1/2
Occidental.....	10 1/2	75c	75c	75c
Ophir.....	14 1/2	14 1/2	15 1/2	15 1/2
Overman.....	23 1/2	18 1/2	18 1/2	18 1/2
Pacific.....	1 1/2	1 1/2	1 1/2	1 1/2
Panther.....	1 90c	80c	50c	1 85c
Poorman.....	10c	10c	10c	10c
Prospect.....	10c	10c	10c	10c
Raymond & Ely.....	20c	14 1/2	15 1/2	15 1/2
Rock Island.....	20c	6 1/2	6 1/2	6 1/2
Sage.....	6 1/2	6 1/2	6 1/2	6 1/2
Seg Belcher.....	25 1/2	23 1/2	20 1/2	20 1/2
Sierra Nevada.....	1 45	1 30	2 30	2 30
Silver Hill.....	1 45	1 30	2 30	2 30
South Chollar.....	1 45	1 30	2 30	2 30
Succor.....	55c	45c	50c	45c
Trojan.....	55c	45c	50c	45c
Union Con.....	11 1/2	10 1/2	10 1/2	10 1/2
Utah.....	11 1/2	10 1/2	10 1/2	10 1/2
Wells-Fargo.....	25c	25c	25c	25c
Woodville.....	9 1/2	8 1/2	8 1/2	8 1/2
Yellow Jacket.....	9 1/2	8 1/2	8 1/2	8 1/2

## Sales at S. F. Stock Exchange.

FRIDAY, A. M., AUG. 24.	2285	Grand Prize.....	148
200 Andes.....	70c	330 Hale & Nor.....	4 40c
100 Alta.....	2 1/2	450 Hussey.....	85c
145 Alpha.....	10c	2150 Justice.....	9 1/2
165 Best & Belcher.....	15 1/2	600 Joe Scates.....	20c
200 Bullion.....	6 1/2	365 Julia.....	1 10 1/2
435 Belcher.....	5 1/2	90 Kentuck.....	5 1/2
270 Chollar.....	33 1/2	400 Leviathan.....	35c
735 Con Virginia.....	28 1/2	505 Leopard.....	2 1/2
160 Con Imperial.....	75c	95 Leeds.....	1 85c
415 Crown Point.....	3 90c	85 Mexican.....	94
620 California.....	27 1/2	100 Morning Star.....	2 1/2
1045 Caledonia.....	3 70c	1100 Meadow Valley.....	90c
125 Eschschuer.....	6 1/2	10 Manhattan.....	11 1/2
960 Gould & Curry.....	8 1/2	400 Modoc.....	55c
600 Hale & Nor.....	4 45c	500 Minnetta Belle.....	1 10c
530 Julia.....	1 20 1/2	770 New York.....	35c
1490 Justice.....	9 1/2	250 Northern Belle.....	17 1/2
30 Kentuck.....	5 1/2	250 Navajo.....	1 35c
75 Lady Washington.....	60c	50 New Coso.....	50c
205 Mexican.....	9 1/2	35 Ophir.....	15 1/2
370 New York.....	30c	420 Overman.....	23 1/2
135 Ophir.....	15 1/2	100 Panther.....	1 40c
1045 Overman.....	24 1/2	200 Peytona.....	1 15c
1000 Peytona.....	1 20 1/2	400 Phenix.....	1 10c
705 Savage.....	6 1/2	205 Raymond & Ely.....	15 1/2
10 Seg Belcher.....	5 1/2	50 Rye Patch.....	3 90c
105 Sierra Hill.....	22 1/2	680 Sierra Nevada.....	6 05c
100 South Justice.....	1 10c	40 Sierra Nevada.....	3 70c
110 Sierra Nevada.....	3 85c	130 Silver Hill.....	2 1/2
50 Trojan.....	10c	300 Solid Justice.....	4 1/2
60 Utah.....	10 1/2	300 Solid Silver.....	4 1/2
45 Union Con.....	50 40c	850 Trojan.....	40 50c
380 Yellow Jacket.....	9 1/2	30 Union Con.....	4 80c
AFTERNOON SESSION.		260 Utah.....	10 1/2
20 Alpha.....	10c	90 Yellow Jacket.....	9 1/2
2050 Argentina.....	1 20c	MONDAY A. M., AUG. 27.	
570 Best & Belcher.....	16 1/2	100 Alpha.....	10 1/2
120 Bullion.....	8 1/2	50 Andes.....	65c
35 Con Virginia.....	28 1/2	450 Alta.....	2 1/2
130 Chollar.....	33 1/2	460 Belcher.....	4 90c
165 California.....	27 1/2	275 Best & Belcher.....	15 1/2
175 Caledonia.....	3 70c	700 Belmont.....	1 10c
900 DeFrees.....	1 35c	790 Con Imperial.....	80 50c
1220 Eureka Con.....	4 25c	120 Crown Point.....	3 90c
470 El Dorado S.....	3 80c	50 Chollar.....	33 1/2
850 El Dorado N.....	5 05c	300 Con Virginia.....	30c
140 Emma Id.....	2 1/2	855 California.....	27 1/2
210 Eschschuer.....	6 1/2	920 Caledonia.....	3 70c
485 Grand Prize.....	1 45c	100 Eschschuer.....	6 1/2
1450 Gila.....	70c	340 Eureka Con.....	34 34c
105 Gen Thomas.....	20c	240 Gould & Curry.....	8 1/2
90 Gould & Curry.....	8 1/2	140 Hale & Nor.....	4 45c
2300 Hussey.....	60c	2805 Justice.....	10 1/2
455 Hale & Nor.....	4 45c	1020 Julia.....	1 05c
455 Justice.....	9 1/2	150 Joe Scates.....	25c
220 K K Con.....	5 1/2	65 Kentuck.....	5 1/2
105 Leopard.....	1 30c	150 Leviathan.....	40 45c
50 Leeds.....	1 30c	150 Mexican.....	9 1/2
855 Meadow Valley.....	90c	100 Morning Star.....	2 1/2
50 Manhattan.....	11 1/2	400 Meadow Valley.....	95c
200 Modoc.....	55c	200 New York.....	30c
45 Minnie Bell.....	1 80c	330 Overman.....	24 1/2
500 Navajo.....	1 40c	750 Overman.....	24 1/2
230 Northern Belle.....	17 1/2	600 Peytona.....	1 20 1/2
105 Overman.....	24 1/2	40 Savage.....	60c
30 Ophir.....	15 1/2	305 Sierra Nevada.....	3 65c
675 Panther.....	1 30c	200 New Imperial.....	3 1/2
100 Phenix.....	1 10c	225 Silver Hill.....	2 1/2
100 Poorman.....	1 10c	100 Solid Silver.....	4 1/2
140 Rye Patch.....	4 30c	350 Trojan.....	40 40c
230 Raymond & Ely.....	16 1/2	165 Utah.....	10 10 1/2
SATURDAY, A. M., AUG. 25.		130 Union Con.....	4 85c
1350 Alta.....	2 1/2	1010 Yellow Jacket.....	9 1/2
50 Alps.....	1 45c	200 Alpha.....	10 1/2
1200 Argentina.....	1 10c	200 Argentina.....	1 45c
230 Best & Belcher.....	15 1/2	150 Alps.....	1 55c
170 Bullion.....	8 1/2	315 Best & Belcher.....	17 1/2
235 Belcher.....	5 1/2	710 Bullion.....	7 1/2
30 Belmont.....	90c	710 California.....	27 1/2
235 Con Virginia.....	28 1/2	630 California.....	27 1/2
85 Chollar.....	33 1/2	240 Con Virginia.....	31 1/2
850 California.....	27 1/2	960 Con Imperial.....	80 50c
920 Con Imperial.....	28 1/2	365 DeFrees.....	1 30c
12 1/2 Crown Point.....	3 85c	200 DeFrees.....	1 30c
425 Caledonia.....	3 45c	10 El Dorado S.....	4 15c
970 DeFrees.....	1 40c	700 Eureka Con.....	34 34c
155 Eschschuer.....	6 1/2	310 El Dorado North.....	5 05c
1020 Eureka Con.....	28 1/2	430 Golden Chariot.....	75c
300 El Dorado S.....	4 30c	315 Grand Prize.....	1 45c
640 Gould & Curry.....	8 1/2	400 General Thomas.....	25c
500 Gila.....	70c	150 Gila.....	60 50c
965 Gould & Curry.....	9 1/2	965 Gould & Curry.....	9 1/2

2100 Hussey.....	55c	80c
250 Hale & Norcross.....	4 30c	45c
100 Jackson.....	1 10c	1 10c
1230 Justice.....	9 1/2	11 1/2
70 K K Con.....	5 1/2	4 1/2
750 Leeds.....	1 85c	90c
250 Leopard.....	2 1/2	2 1/2
1150 Meadow Valley.....	90c	90c
630 Modoc.....	55c	55c
50 Manhattan.....	11 1/2	11 1/2
100 Minnie Bell.....	1 80c	1 80c
100 Mexican.....	94c	94c
1400 Navajo.....	1 30c	1 30c
960 New Coso.....	50c	50c
360 Northern Light.....	2 1/2	2 1/2
250 Northern Belle.....	17 1/2	17 1/2
635 Ophir.....	15 1/2	15 1/2
345 Overman.....	25 1/2	25 1/2
700 Poorman.....	1 10c	1 10c
750 Panther.....	1 45c	1 45c
430 Phenix.....	1 10c	1 10c
690 Rye Patch.....	3 40c	3 40c
400 Raymond & Ely.....	16 1/2	16 1/2
515 Sierra Nevada.....	3 80c	3 80c
100 Utah.....	10 1/2	10 1/2
3120 Yellow Jacket.....	9 1/2	9 1/2
TUESDAY, A. M., AUG. 26.	362 1/2	362 1/2
920 Alta.....	2 1/2	2 1/2
25 Andes.....	11 1/2	11 1/2
725 California.....	27 1/2	27 1/2
400 Bullion.....	8 1/2	8 1/2
825 Belcher.....	5 1/2	5 1/2
875 Best & Belcher.....	15 1/2	15 1/2
100 California.....	27 1/2	27 1/2
110 Con Virginia.....	28 1/2	28 1/2
335 Chollar.....	33 1/2	33 1/2
675 Crown Point.....	4 10c	4 10c
1925 Caledonia.....	4 05c	4 05c
1500 Con Imperial.....	85c	85c
80 Caledonia.....	3 90c	3 90c
50 Challenge.....	1 1/2	1 1/2
50 Dayton.....	60c	60c
400 Dandelion.....	1 10c	1 10c
800 DeFrees.....	1 35c	1 35c
2235 Gould & Curry.....	8 1/2	8 1/2
1125 Hale & Norcross.....	4 45c	4 45c
545 Julia.....	1 20 1/2	1 20 1/2
50 Joe Scates.....	25c	25c
800 Justice.....	9 1/2	9 1/2
60 Kentuck.....	5 1/2	5 1/2
130 Leviathan.....	45c	45c
200 Lady Washington.....	75c	75c
630 Leach.....	3 1/2	3 1/2
400 North Con.....	25c	25c
440 New York.....	30c	30c
60 Occidental.....	75c	75c
680 Overman.....	27 1/2	27 1/2
200 Peytona.....	1 15c	1 15c
200 Prospect.....	30 1/2	30 1/2
1055 Savage.....	6 1/2	6 1/2
1705 Sierra Nevada.....	4 45c	4 45c
100 South Justice.....	1 10c	1 10c
815 Silver Hill.....	2 1/2	2 1/2
200 Trojan.....	85c	85c
230 Union Con.....	4 80c	4 80c
700 Utah.....	10 1/2	10 1/2
150 Wells-Fargo.....	25c	25c
1150 Yellow Jacket.....	9 1/2	9 1/2
1775 Argentina.....	1 45c	1 45c
400 Alps.....	2 1/2	2 1/2
90 Belmont.....	1 15c	1 15c
475 Best & Belcher.....	15 1/2	15 1/2
55 Chollar.....	34 1/2	34 1/2
400 Con Virginia.....	28 1/2	28 1/2
210 California.....	27 1/2	27 1/2
405 Caledonia.....	3 45c	3 45c
855 DeFrees.....	1 30c	1 30c
110 El Dorado S.....	4 10c	4 10c
720 El Dorado N.....	5 05c	5 05c
840 Eschschuer.....	6 1/2	6 1/2
300 Empire Id.....	2 1/2	2 1/2
100 El Dorado North.....	5 05c	5 05c
2000 Gila.....	15 1/2	15 1/2
775 Grand Prize.....	1 45c	1 45c
50 General Thomas.....	25c	25c
140 Golden Chariot.....	75c	75c
770 Gould & Curry.....	8 1/2	8 1/2
700 Hussey.....	30c	30c
360 H & Norcross.....	4 30c	4 30c
140 Jackson.....	5 1/2	5 1/2
1310 Justice.....	9 1/2	9 1/2
30 K K Con.....	5 1/2	5 1/2
220 Leach.....	3 1/2	3 1/2
400 Leeds.....	1 80c	1 80c
600 Minnie Bell.....	1 80c	1 80c
200 Meadow Valley.....	90c	90c
150 Manhattan.....	11 1/2	11 1/2
1045 Modoc.....	55c	55c
70 Mexican.....	94c	94c
850 New Coso.....	50c	50c

## SALES OF LAST WEEK AND THIS COMPARED

THURSDAY, A. M., AUG. 23.	120 Alpha.....	10c	THURSDAY, A. M., AUG. 30.	145 Alpha.....	10c
270 Andes.....	50c	70c	860 Alta.....	2 1/2	2 1/2
320 Alta.....	2 30c	35c	120 Andes.....	70c	70c
360 Best & Belcher.....	15 1/2	15 1/2	230 Bullion.....	70c	70c
300 Belcher.....	51c	51c	305 Belcher.....	51c	51c
320 Belcher.....	51c	51c	305 Belcher.....	51c	51c
415 California.....	26 1/2	27 1/2	510 Con Imperial.....	75c	75c
10 Confidence.....	1 45c	1 45c	50 Crown Point.....	3 80c	3 80c
240 Caledonia.....	3 55c	3 55c	120 Chollar.....	34 1/2	34 1/2
400 Chollar.....	32 3/4	32 3/4	675 Con Virginia.....	28 1/2	28 1/2
60 Crown Point.....	4 10c	4 10c	100 Confidence.....	1 1/2	1 1/2
610 Con Imperial.....	75c	75c	250 Caledonia.....	3 40c	3 40c
275 Con Virginia.....	28 1/2	28 1/2	300 Eschschuer.....	6 1/2	6 1/2
520 Eschschuer.....	6 1/2	6 1/2	720 Gould & Curry.....	8 1/2	8 1/2
100 Eureka Con.....	28 1/2	28 1/2	1050 Gould & Curry.....	8 1/2	8 1/2
1050 Gould & Curry.....	8 1/2	8 1/2	15 Grand Prize.....	1 45c	1 45c
15 Grand Prize.....	1 45c	1 45c	640 Hale & Nor.....	4 45c	4 45c
640 Hale & Nor.....	4 45c	4 45c	560 Julia.....	1 20 1/2	1 20 1/2
560 Julia.....	1 20 1/2	1 20 1/2	200 Joe Scates.....	13c	13c
50 Kentuck.....	5 1/2	5 1/2	870 Julia.....	1 1/2	1 1/2
100 Leviathan.....	45c	45c	1000 K K Con.....	5 1/2	5 1/2
505 Mexican.....	9 1/2	9 1/2	100 Lady Wash.....	50c	50c
725 Grand Prize.....			450 Leviathan.....	35c	35c
120 New York.....	35c	35c	95 Mexican.....	9 1/2	9 1/2
1000 Old.....	28 1/2	28 1/2	150 New York.....	35c	35c
50 Occidental.....	75c	75c	100 Old.....	28 1/2	28 1/2
300 Ophir.....	15 1/2	15 1/2	510 Ophir.....	16 1/2	16 1/2
265 Peytona.....	1 10c	1 10c	30 Occidental.....	75c	75c
25 Raymond & Ely.....	15 1/2	15 1/2	300 Peytona.....	1 10c	1 10c
320 Sierra Nevada.....	3 1/2	3 1/2	70 Seg Belcher.....	43c	43c
20 Seg Belcher.....	3 1/2	3 1/2	400 Sierra Nevada.....	3 1/2	3 1/2
395 Silver Hill.....	2 65c	2 65c	405 Savage.....	7 1/2	7 1/2
320 South Justice.....	30 45c	30 45c	515 Silver Hill.....	3 1/2	3 1/2
430 Union Con.....	4 80c	4 80c	100 South Justice.....	3 1/2	3 1/2
500 Union Con.....	4 80c	4 80c	355 Trojan.....	85c	85c
560 Yellow Jacket.....	9 1/2	9 1/2	230 Union Con.....	10 1/2	10 1/2
AFTERNOON SESSION.			250 Yellow Jacket.....	10 1/2	10 1/2
1200 Argentina.....	1 16c	1 20	AFTERNOON SESSION.		
50 Alps.....	15 1/2	15 1/2	50 Alps.....	15 1/2	15 1/2
55 Best & Belcher.....	15 1/2	15 1/2	240 Alta.....	2 1/2	2 1/2
130 Belcher.....	4 95c	4 95c	190 Belmont.....	8 1/2	8 1/2
390 Con Virginia.....	29 3/4	29 3/4	170 Belcher.....	51c	51c
240 Caledonia.....	3 40c	3 40c	1000 Belcher.....	1 1/2	1 1/2
50 Caledonia.....	3 55c	3 55c	100 Chollar.....	34 1/2	34 1/2
50 Crown Point.....	3 80c	3 80c	1470 Con Virginia.....	32 3/4	32 3/4
1600 Con Imperial.....	75c	60c	460 California.....	29 1/2	29 1/2
120 Chollar.....	32 3/4	32 3/4	50 DeFrees.....	1 45c	1 45c
60 Crown Point.....	4 10c	4 10c	1000 DeFrees.....	1 45c	1 45c
630 Eureka Con.....	45 1/2	44 1/2	850 El Dorado South.....	3 1/2	3 1/2
510 El Dorado S.....	4 1/2	4 1/2	200 Empire Id.....	1 10c	1 10c
545 El Dorado N.....	30 60c	30 60c	150 Eschschuer.....	6 1/2	6 1/2
50 Empire Id.....	21 1/2	21 1/2	500 Golden Chariot.....	7 1/2	7 1/2
600 Eschschuer.....	6 1/2	6 1/2	70 Gould & Curry.....	8 1/2	8 1/2
100 Golden Chariot.....	8 1/2	8 1/2	70 Hussey.....	55c	55c
510 Gila.....	70 65c	70 65c	40 Hale & Nor.....	4 45c	4 45c
235 Grand Prize.....	1 31 1/2	1 31 1/2	330 Jackson.....	50c	50c
170 Gould & Curry.....	8 1/2	8 1/2	320 Justice.....	85c	85c
1050 Hualapai.....	8 1/2	8 1/2	300 Leeward.....	1 10c	1 10c
140 Hale & Nor.....	4 30c	4 40c	30 Leopard.....	75c	75c
260 Julia.....	63 1/2	63 1/2	220 Leeds.....	1 80c	1 80c
430 Justice.....	9 1/2	9 1/2	400 Meadow Valley.....	90c	90c
100 K K Con.....	5 1/2	5 1/2	1200 Modoc.....	50c	50c
100 Leopard.....	1 95c	1 95c	100 Mansfield.....	50c	50c
200 Leeds.....	1 80c	1 80c	1820 Minnetta Belle.....	12 1/2	12 1/2
100 Meadow Valley.....	90c	90c	100 Northern Belle.....	17 1/2	17 1/2
50 Modoc.....	50c	50c	125 Ophir.....	16 1/2	16 1/2
300 Manhatnat.....	11 1/2	11 1/2	315 Overman.....	1 10c	1 10c
1000 Minnetta Belle.....	1 1/2	1 1/2	600 Panther.....	1 05c	1 05c
100 New Coso.....	60c	60c	1000 Overman.....	1 10c	1 10c
100 Northern Belle.....	17 1/2	17 1/2	100 Raymond & Ely.....	16 1/2	16 1/2
150 Ophir.....	15 1/2	15 1/2	300 Steptoe Con.....	1 10c	1 10c
345 Overman.....	23 1/2	23 1/2			



# MINING SUMMARY.

The following is mostly condensed from journals published in the interior, in proximity to the mines mentioned.

## California.

### AMADOR.

**MOORE RICH QUARTZ.**—*Amador Dispatch*, Aug. 29: Mr. W. S. Dunning still continues to take out some extraordinarily rich rock from his mine, near the Motherlode claim. We were shown several pieces of rock taken out a day or two ago, which were literally studded with gold plainly visible to the naked eye. There is no longer any doubt that this mine will prove a very valuable piece of property, when fully developed and properly worked.

**KENNEDY MINE.** The further prospecting of the Kennedy mine under the superintendence of Mr. James Fleming, is bringing forth flattering results. Where he is now at work is down about 100 feet, and drifts are run over 200 feet; and we are told that the rock is of a very superior quality—the ledge being about four feet wide. Mr. Fleming is a careful and skillful manager, and we have but little doubt that the Kennedy mine will soon be running again at full blast, it he continues to be its Superintendent. We believe the mine will yet prove to be among the best mines in the county.

**STARTED UP.**—*Amador Ledger*, Aug. 18: The new hoisting works of the Potolmi mine have started up. The water has been taken out for 50 feet in the shaft. The Government has stopped running, owing to failure of the water supply. Twenty men will be idle until the commencement of the rainy season. Meantime the sinking of the new shaft is to be vigorously prosecuted.

A rumor is in circulation that the Mahoney will be shut down this week, to await the decision of the courts.

### BUTTE.

**FEATHER RIVER MINES.**—*Marysville Appeal*, Aug. 24: From George A. Duckstadter, Superintendent of the Main Feather River mining company, we learn that they have every arrangement completed to commence work next week. The machinery is in position upon the ledge, and the engines have been tested to prove their working order. All that is necessary to complete the outfit is the joining of a section to the tube or sucker. The machine will be put in operation about half a mile above the bridge at Oroville—near the foot of the mining dam of the old Cape claim. This will make three boats that are operating this river, two being owned by the California Breeding and Mining Company. The company have one of the boats with a sucker, at work three miles above Oroville (on Long's bar), and the other is working on the ground of Shaffer & Parks, two miles below the town. It is said at the latter place as high as \$45 have been taken out in one hour's run.

### CALAVERAS.

**POTTER AND RODGERS' BONANZA.**—*Calaveras Chronicle*, Aug. 25: Some of the richest quartz that was ever found in the State has lately been discovered in the Blue Jay mine, at Mosquito, owned by Messrs. Potter & Rodgers. Specimens of the ore were brought to town recently, and we are free to confess that we never saw anything approximating them in richness. Some pieces of the rock were apparently more than half gold. We learn that a small piece of the ore, weighing less than five pounds, was sold to San Francisco parties for \$250. The ledge in the Blue Jay has widened out to seven feet, and all the indications are of the most encouraging character. Work is progressing steadily, and, as developments advance, the prospect for a permanent paying mine is constantly brightening. Messrs. Potter & Rodgers deserve success for the great degree of perseverance and energy they have shown, and we are pleased to know that they are meeting a richly merited reward.

**UPPER COUNTRY JOBS.**—The Hull mill, at the Zaeetero mine, West Point, is running steadily, with good results. Work is progressing steadily, and, as developments advance, the prospect for a permanent paying mine is constantly brightening. Messrs. Potter & Rodgers deserve success for the great degree of perseverance and energy they have shown, and we are pleased to know that they are meeting a richly merited reward.

**FRESNO.** **SPECIMENS.**—*Fresno Examiner*, Aug. 25: We were shown some very fine specimens of quartz taken from the mine of A. J. Thorn. The rock was taken out at a depth of 120 feet, and shows a large amount of free gold. The rock is also rich in sulphurates. Mr. Thorn is the sole owner of one of the most promising quartz mines in the State. Several years ago he worked the mine, and over \$16,000 was extracted from it, but on account of an accident, by which he lost his arm, he was compelled to quit work, and another prospecting work on the mine failed to make it pay. Mr. Thorn intends to develop the mine and work it.

### INYO.

**MINNETTA.**—*Coso Mining News*, Aug. 25: There arrived here last Thursday, J. H. Jacobs, President of the Minnetta Belle company, in company with J. H. Jacobs, late owner of their splendid 10-stamp mill, who comes to turn over the property to the company, they having lately purchased the same. C. M. Blair will be installed as business manager of the mill, while Bedford Chase will act as mill-man and foreman. W. E. Brown, the present efficient Superintendent of the mines, will be retained. The work heretofore has been too arduous for one man, and it is anticipated that in running the mill, etc. The Minnetta will undoubtedly ship bullion during next month to the amount of \$40,000, which will be sufficient to pay off all their debt and leave a surplus on hand. The ore is now being worked in the mill at an expense of \$10 to \$11 per ton, the ore averaging \$100. The mines are looking first-rate and improving with every day's development.

**COSO CO.**—On the Bella Union they are stopping east of the lower winze and in fine ore, the average width being three feet. They are also making a new development south of the winze, which is yielding ore of a fine quality and the vein widening as they advance. The prospects in the lower workings have never been as flattering as at present. The mine will, we think, soon be in condition to produce ore in abundance.

**CURVOR.**—Ore is being hauled to the furnaces for reduction, both from the Cuervo and Promontorio mines of the company. **DEFIANCE.**—Prospects brightening with every day's work and goodly quantities of ore being extracted and loaded to the furnaces, which, under the able management of Mr. J. S. Cornat, are turning out bullion at the rate of 10 tons per day. A shipment has been made since starting of the furnaces, and teams are now being waited for to take away that on hand.

### LAKE.

**FORCE REDUCED.**—*Lower Lake Bulletin*, Aug. 20: We learn that four of the eight furnaces of the Reddington mining company have been shut down, the fine ore furnaces only being kept in operation. The force has been reduced from 275 men to 60, and quite a number of people have moved away in consequence, leaving Knoxville lifeless and dull.

### NEVADA.

**A GOOD CLEAN-UP.**—*Grass Valley Union*, Aug. 25: The last clean-up of quartz from the Centennial mine was made on the 24th inst., a day or two ago, and the result was \$2,097 from 11 loads, or \$227 per load. The Centennial company thought the rock would mill \$150 per load, and were agreeably surprised at the large increase. The mine is producing more quartz of the same kind.

**PLANET GRAVEL MINE.**—This mining company, a Grass

Valley organization, but whose property is in the vicinity of Liberty hill, and on the dividing ridge between Steep Hollow and Bear river, are very energetically engaged in driving a bedrock tunnel through to the gravel deposit. The tunnel was commenced two months ago, and is now in 224 feet. The entire distance to be run is about 500 feet, and it is believed that the work will be accomplished in six months. The Swamp Angel company, the adjoining claim, is taking out regular and profitable pay all the time, and the McCann claim, on the same channel, on the west side of Steep Hollow, is yielding very largely, being, in fact, one of the best gravel claims in the State. The Planet ground is coming into strong favor, as it is regarded as one among the most promising gravel locations in the county.

**FINE YIELD OF GOLD.**—*Nevada Transcript*, Aug. 25: We saw yesterday at Phil. Richards' banking-house, on Main street, a beautiful lot of gold from the Eagle claims at Moore's Flat, which had just been run out by J. J. Sawyer. The gold was from a run of about 13 weeks, and was valued at \$5,000. Phil. Richards has been doing a land office business during the past week. One lot of gold from the Blue Bank company, Moore's Flat, yielded \$3,340; from Hagerly & Co.'s claims, \$2,704; and from small lots, \$2,500, making a total for the week, including that from the Eagle claims, of \$18,642. Most, or about one-half, of the gold was from the vicinity of Moore's Flat. Oh, yes, the mines are all "played out."

**ANOTHER BIG BLAST.**—The Blue Tent Co. gravel mine has been using a good deal of powder this season. On Monday last another big blast was fired in the Blue Tent claim there that did splendid work. The drift was run under a bank 100 feet below the surface. It was run in 75 feet in hard cement. At the end of the parallel drift was a large pile of powder. There were 10 tons of black powder placed in the drifts, and the tunnel filled up to the mouth. The powder was ignited by electricity. The whole body of ground above the drifts and for a considerable distance beyond was raised bodily and finely pulverized. It was estimated that 200,000 tons of earth were broken and pulverized for washing by the explosion. The blast was fired by J. J. Sawyer, the chairman of the Board of Directors, who resides in London. The property is principally owned in London. The company have expended over \$200,000 in cutting a ditch to convey water to the mine, and have spent an equal amount in fitting up their claims. They own three extensive claims. They are now in a condition to reap a profit from the working of the mine. They have run bedrock drifts to get a full for waste material, and are making arrangements for other work, which, when completed, will allow them to work the claims to the greatest advantage, and with profit to the owners. They are now using 1,400 inches of water in the south Yuba claim every 12 hours, and will now be enabled to use 1,200 inches in the Blue Tent. They are going to run a tunnel in from Gopher ravine so as to wash off the top dirt and arrange so that only the rich bottom dirt will be run through the other tunnels. They will then be able to use from 3,000 to 5,000 inches of water every 12 hours. When this work is all completed there is nothing to prevent the Blue Tent company from making the annual clean-ups as large as any mine in the county.

**GOOD PROSPECTING REGION.**—*Foothill Tidings*, Aug. 25: Over in the vicinity of Rough and Ready, one of the best placer mining localities of early days, there seems to be less than attention paid to seeking quartz than the early returns in gold quartz would lead one to expect. The Kentucky Ridge, now just started at regular work of gold production, is in that region, and a short distance below is the "Ironclad," a location made on the 20th of last month by John Fippli and H. Scribner. They have put down a shaft there about 20 feet, and from about two tons of rock worked at the Larimer mill this week, taken out in sinking, gold bullion to the value of \$42 was returned. We saw the bar. They have a 16-inch ledge of milling ore, and we are told that it is better at the bottom than at any other point. Among other claims in that vicinity, which only await capital to open them up, are the "Prophet Girl," the "Hayes," the "Moore," the "Blue Bank" and the "Oro Verde." Capitalists who wish to buy, or prospectors who would like to find a gold mine, would do well to call upon either of the parties above named, who will aid them in their search with great pleasure.

### PLACER.

**DUTCH FLAT FORUM.**, Aug. 24: Mining news is scarce this week; we note nothing worthy of mention. All the claims in this section are idle for want of water, excepting the Baker claim, and this claim will make its final clean-up for the season within a few days.

### SIERRA.

**PROSPECTING.**—*Mountain Messenger*, Aug. 25: A great deal of prospecting is now being done in this county, more than for a long time past. That is what is wanted.

**NORRIS.**—The Mammoth Springs company recently found \$22-ore nugget in their claims above Allegheny. The company have been taking out \$10 per day to the man all summer.

### TUOLUMNE.

**AUTUMN BIG STRIKE.**—*Tuolumne Independent*, Aug. 25: Dan. Hennessey and Pat. King have made another big strike in their quartz lode at Saw Mill Flat. Within the last two or three weeks they have taken out several thousand dollars. On Monday of this week it was expected that they would realize a large amount, as they had been blasting the ledge away, leaving a large mass of gold in sight, which they could capture on that day.

## Nevada.

### WASHOE.

**BELCHER.**—*Gold Hill News*, Aug. 20: Sinking the air shaft is going rapidly forward. It has nearly reached the point at which the 2000-ft station is to be opened. The old shaft has reached the same level, and sinking the shaft is being continued for a pump. The ore prospects south on the 1000-ft level continue to improve as the drift progresses.

**JUSTICE.**—Daily yield, 350 tons of ore. The ore stops continue a steady yield and favorable look from the 500 down to the 800-ft level. The east drift, on the 1150-ft level, is evidently nearing the main ore vein, the quartz streaks being largely on the increase and of a very favorable character.

**SAVAGE.**—Draining the water is making better progress than for months past. The pumps have been at last made to work steadily, for the week past, in conjunction with those of Hale & Norcross, and have lowered the water 80 feet below the 1000-ft station.

**JULIA.**—The ore prospects of the east cross-cut, on the 1800-ft level, are steadily on the increase, the face of the drift showing a much more favorable character of matter.

**SILVER HILL.**—The new pump-bell and other machinery has arrived at the mine and is being placed in position.

**OPHIA.**—Sinking the joint winze on the Mexican line, below the 1700-ft level, is going steadily ahead, the bottom in good working ground.

**HALE & NORCROSS.**—The water is down 35 feet below the 1000-ft level, and is being rapidly drained by the new pumping works, in conjunction with those of the Savage.

**MEXICAN.**—The north drift on the 1000-ft level is making steady and favorable progress. Sinking the joint winze on the Ophir line is going steadily forward.

**CROWNS POINT.**—The south drift on the 2000-ft level, running to connect with the Belcher drain-shaft, is fast approaching completion.

**SAVAGE.**—Draining the water is making better progress than for months past. The pumps have been at last made to work steadily, for the week past, in conjunction with those of Hale & Norcross, and have lowered the water 80 feet below the 1000-ft station.

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**HALE & NORCROSS.**—The water is down 35 feet below the 1000-ft level, and is being rapidly drained by the new pumping works, in conjunction with those of the Savage.

**MEXICAN.**—The north drift on the 1000-ft level is making steady and favorable progress. Sinking the joint winze on the Ophir line is going steadily forward.

on all the ore-producing levels of the mine are looking splendidly, and are yielding rich ores. The returns from the mills warrant the assertion that the monthly yield for August will exceed that of the mine for the same length of time for the past six months, and the average of bullion produced is already in excess of that for the month of July. This secures beyond a doubt the payment of the regular monthly dividend of \$2 per share. On the 1000-ft level the ore stops are being gradually extended southward, and the 1650-ft level northward, following the west side of the ore vein. The ore at both points is of a splendid character. A drift west from winze No. 4, on the 1650-ft level, has penetrated the ore vein a distance of 22 feet, the entire distance being in ore of the richest character. On the 1650-ft level No. 3 winze has just been started and is now down 15 feet, the bottom in rich ore. The branch drift from the C. & C. shaft, on the 1750-ft level, is being pushed ahead to reach the ore at the very earliest day possible. The south drift on the 1450-ft level is still advancing, running west of the ore vein. The haul in this drift is steadily on the increase, and makes the progress necessarily much slower. Sinking the C. & C. shaft below the 1850-ft level is being pushed vigorously forward. The flow of water is still strong.

**CON. VIRGINIA.**—Daily yield, 500 tons of ore. The ore stops going south on both the 1300 and 1300-ft levels are yielding rich ore, and the west drift from winze No. 4, on the 1400-ft level, promises a yield of many thousands of tons of gold milling ore yet. On the 1550-ft level a large force of men are employed in enlarging the ore connections with the Gould & Curry and in opening the south end of the mine so as to get at the ore bodies remaining in that quarter. On the 1500-ft level a drift is being run southward in the ore vein to connect with winze No. 2, on that level, providing that a large amount of rich ore on that level ready for extraction. On the 1650-ft level the west cross-cut near the California line, which was stopped in the vein when the ledge was struck, is being extended to the westward to connect with the bottom of the Con. Virginia shaft, which is now being sunk from the 1550 to the 1650-ft level to meet the drift. The ore in the face of the drift is of a fine character. The ore stops on the 1650-ft level are being gradually extended to the southward toward the deep winzes. The sill floors continue in ore of the richest character. There will be no stoppage of the work of sinking the C. & C. shaft, but as soon as the 1850-ft station is opened the sinking will be continued, to reach and open the 1950-ft level.

**YELLOW JACKET.**—The main east drift at the 2200-ft level is in 245 feet from the winze. The face of the drift is in green porphyry, with promising seams of quartz. The new shaft is down 552 feet, with the bottom in good sinking ground. The water decreases continually. The heavy hoisting gear is being placed in position, and will be ready to start into active operation in about two weeks. **BONANZA.**—Sinking the main shaft is making the usual fair progress, the bottom in good working ground. The burst of water struck during the middle of the present month still continues, but the flow is now light and does not materially impede the progress of work. The present developments in the new shaft (as of the old; fully warrants the belief that a good body of pay ore is near at hand.

**SILVER NADABA.**—The south drift on the 1450-ft level has reached the south line, at which point an upraise has been driven a distance of 113 feet, to reach the level of the north drift, approaching through the Mexican ground. This raise was made at the rate of eight feet per day, being one of the quickest pieces of work of the kind ever performed on the Comstock.

**GOULD & CURRY.**—Sinking the main incline was impeded during the first portion of the week by a strong stream of hot water, that poured in from a crevice on the east side of the shaft. This necessitated the putting in of small pumps to carry the water to the station above, since which time the work has been progressing as before.

**LADY BYRON.**—The placing of the new hoisting machinery in working position is being pushed forward to completion as fast as possible. It will be ready for service in about a week.

**ALTA.**—The west drift, on the 1050-ft level, has reached the east wall of the ledge, encountering quartz and ore of a good character. As soon as the east wall was reached the drift was stopped, and two drifts, one north and the other south, started to run parallel with and along side of the ore vein.

**UTAH.**—Sinking the incline winze below the 1150-ft level is going steadily ahead, the bottom in hard blasting ground. The face of the north drift, on the 1150-ft level, is still in the finest character of quartz.

**CHOLLAR-POTOSI.**—Daily yield, 30 tons of ore, the assay value of which is \$23 per ton. There is no change in any of the old workings of the mine.

**SUTRO TUNNEL.**—The face of the header still continues in soft porphyry and clay, with occasional streaks of quartz. It is in the regular Comstock vein material. Water decreases somewhat. Total length of tunnel, 18,911 feet.

**CALEDONIA.**—The northeastern drift on the 1400-ft level is showing some very fine quartz and ore prospects. The drift north on the 1600-ft level is also looking very favorable.

**SICOR.**—Sinking the main shaft is going steadily forward, the bottom in ground of a very hard description.

**BULLION.**—The repairs to the shaft are steadily approaching completion.

**LEVIATHAN.**—The whole face of the south drift, at the 600-ft level, is in quartz with streaks of good ore.

## CHERRY CREEK DISTRICT.

**STAR.**—*Eureka Sentinel*, Aug. 25: We learn from Col. J. J. Dunne, who arrived last Thursday in Eureka, from an extended tour through the mining districts south and east of this point, that the Star mining company, of Cherry Creek, are erecting a 20-stamp mill, with roasting furnaces, at that place. The material for the building and the machinery are on the ground, and a force of men busily engaged in grading the mill site and framing timbers for the structure. The company are putting up a Howell's impromptu water-raising furnace, with a boiler that is running successfully on the ores of Brodie district. They are also building steam hoisting works on the mine. The mine is opened by a perpendicular shaft, which has attained a depth of 300 feet. It is well timbered from top to bottom, and the ore will be hoisted on a safety cage of the latest pattern. A splendid body of ore has been exposed in the lower level, and it is estimated that there are from 8,000 to 10,000 tons in sight, valued at from \$100 to \$200 per ton. The company expect to have the mill running in 60 days. The town, under the stimulus of operations at the mines, is living up and business improving.

## EUREKA DISTRICT.

**THE MATAMORAS MINE.**—*Sentinel*, Aug. 20: The Matamoras mine is proving itself to be one of the best properties in the district, and recent developments in the lower levels are very encouraging to the owners. A large body of very high grade ore has been struck, at a depth of 160 feet, and promises to prove a veritable bonanza. We were shown some magnificent specimens, taken at random from the drift, and upraise, which is claimed to be an average of the vein matter at that point. They were very rich in precious metals, assaying \$230 in gold and \$400 in silver, and carrying about 30 per cent. in lead. Mr. Dimock has submitted plans to the company for the erection of hoisting works and the building of a tramway from the mine to the foot of the mountain, in the neighborhood of the new proposed Prospect Mountain tunnel. It is thought that the tramway can be built and operated at a very small outlay.

The run at the Matamoras furnace has been a very successful and profitable one so far, and the company are well satisfied with their bullion returns; but, since the recent developments in the mine, the fact is recognized that greater results are to be expected. With this view, it is probable that great improvements will be added during the coming month. The company will, after the completion of the present run, tear down the old Butcherup, and rebuild further up the hill. This move is necessary, in order to procure more dump room. The new

furnace will be of the latest and most approved pattern, and have a reducing capacity of 50 tons per day.

**THE PROSPECT MOUNTAIN TUNNEL.**—The Prospect Mountain tunnel company are very much encouraged by recent developments in their tunnel. Work has been carried on very persistently for some months past, and a force of men employed in driving it into the bowels of old Prospect, hoping, when it had been carried a sufficient length, to meet with a lode that would recompense the company for their outlay. The first 500 feet were driven through hard limestone, and the progress was necessarily slow, but after that length was passed, the miners encountered quartzite, consisting of which are multibodies of rich ore. The enterprise is of vast importance to the quartz interest in that section, and on its developments hinges the investment of a large amount of capital.

## HUNTER DISTRICT.

**HOISTING WORKS.**—*Eureka Sentinel*, Aug. 25: Steam hoisting works have been erected over the main shaft at the Hunter Consolidated, and are in perfect working order. The shaft has attained a depth of 220 feet. The mine is looking well throughout the various levels, and there is a large quantity of rich ore in sight. The furnaces will be completed and started up about the 20th of September.

## TYBO DISTRICT.

**STRUCK.**—*Eureka Sentinel*, Aug. 20: The Tybo Consolidated Company at Tybo have struck a very rich body of ore in the "Hunkidori" shaft, and it is pronounced to be one of the finest developments ever made in the mine. A private letter, received in Eureka yesterday, states that the furnaces of the company will turn out more bullion during the month of September than ever before during the history of the camp; all of which is good news for our southern neighbor.

## WARD DISTRICT.

**PAYMASTER AND PLEASURES.**—*Eureka Sentinel*, Aug. 20: John B. McOee, the other day, made a critical examination of mining affairs in Ward district. He asserts that the future of the mine on which are situated the Paymaster and Pleasures is one of the largest and richest in the State. At some points he thinks its width is from 500 to 600 feet. The two mines above mentioned he considers grand properties. The ore is of exceeding high grade, and it seems to occur in the greatest abundance. Mr. McOee evidently believes that Ward has a bright future before it.

## Arizona.

**BRADSHAW.**—*Arizona Enterprise*, Aug. 18: In this county considerable work is being done. In the Bradshaw a force of men are at work upon the ore, and are taking out some good rock. P. A. Craicu has been busily at work preparing for the operations which are to be soon commenced on the Tiger by J. H. Helm. He has made a good road from the mine to connect with what is called Luke's road. The hoisting works, pumps, etc., for this mine have arrived in the Territory, and will soon be on the ground.

**LYNX CREEK DISTRICT.** There are a number of mines being worked in a small way, and yielding ore of high grade in paying quantities. The placer miners are also busy. Owing to the scarcity of water some of them are dry-washing and making wages.

**AQUA FRIA.**—Colonel Reynolds has men at work on the Eyrie mine on the Agua Fria. Some very rich chloride ore is being taken out. **ORO BONITA, Cram and Dolan** have taken out some very fine gold ore, much of it yielding as high as \$100 to the ton. It will be worked in astras.

**PECK.**—There is no material change in the mining operations in Peck district, with the exception of the preparations for taking in the Peck mill.

**WALNUT GROVE.**—The Hoeller mill in Walnut Grove district is being up rapidly, and will be in operation in a very few weeks.

**AZTEC MINE.**—*Arizona Citizen*, Aug. 18: We get the following news from this mine from Manager John E. Magee: Cut No. 2 is in 45 feet clear across the vein. Actual width of vein in the bottom of the cut, 13 feet 7 inches; solid body of metal six feet wide, with stringers on each side, carrying four to six inches of metal. Depth of the vein is 32 feet. On both sides of the vein the ore is gradually enlarging and becoming more solid. The character of the metal is slowly changing, and assays from \$100 to \$210 per ton. The wall and country rock is granite and syenite. The vein matter is fine quartz and some tale. There are about 60 tons of ore on the dump. Grinding for large ore dumps is under way, and general work is being done to put everything in the best possible shape. In September we will be ready to keep a 10-stamp mill running steadily.

**PINAL MINES.**—Times are dull, owing to the King mine discharging all its working men but seven. As to the King mine itself, it surpasses all other mines yet discovered in Arizona. I left Tucson last February and came to the King, but found everything looking so dark and gloomy that I went prospecting, and 10 miles northwest of the King I discovered a mine known as the Reynolds, after which the district is named. This mine is 65 feet in width, and can be traced six miles by its mineral, and on it are 13 locations of 1,500 feet each. I have a shaft down 50 feet on the Randolph, and the vein is about 90% free milling ore. Six miles from the north district is the pine stratum, so I went prospecting, and 10 miles northwest of the King I discovered a mine known as the Reynolds, after which the district is named. This mine is 65 feet in width, and can be traced six miles by its mineral, and on it are 13 locations of 1,500 feet each. 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Continued from page 130

stance looking like an oxide of iron. A lump of this odd ore, just as it comes from the mine, is shown at Wells, Fargo's office in Auburn. It weighs 9 ozs. 16 pwt., and its value is at least \$130. Mr. Bell has named this mine "Life Preserver," as he had passed through some pretty rough experience for several years before its discovery.

The future uses of Lake Tahoe water and the mining prospects of Placer county are naturally allied. Yet the lake is not wholly in Placer county. Besides being divided between two States, it lies partly in three counties of Nevada and also in El Dorado county, California.

No tourist can ever regret a visit to Lake Tahoe, and let us hope the readers of this sketch will not be wearied by this *quasi* visit with the writer.

July, 1877.

[As Major Wright concludes, carnelians are of inorganic origin. Both carnelian and chalcedony, and several others, are members of the quartz family, and are of flinty or silicious composition. On the other hand, amethyst, even its hardest known state, does not contain any silicious matter, but preserves its organic composition, and shows by analysis carbonic hydrogen and oxygen. We see no reason to hold for a moment to an organic origin for the members of the quartz family.—EDS. PRESS.]

## THE ENGINEER.

### The Rothschoberger Water-Adit.

After 33 years of uninterrupted labor the great undertaking of the Rothschoberger water-adit is so far completed as to admit of its use. The method of draining the Freiberg mines by means of a deep tunnel had already been discussed in the beginning of the present century, as a question of necessity for the future mining prosperity of the vicinity; and undoubtedly the Rothschoberger tunnel is the greatest work of the kind that has ever been undertaken to aid the exploration of a mining district. Other great adits, such as those of the Hartz mountains and the famous Sutor tunnel, fade when compared with a tunnel which has already attained a length of more than 26 English miles, and will be with its branches when completed more than 31½ miles. The plan was to conduct the water from the Freiberg mines to the nearest practicable point on the River Elbe. Rothschoberg, 12 kilometers above Meissen, was chosen as the most advantageous place for the mouth, on account of its having the lowest level at the shortest distance from Freiberg. The preliminary surveys were made in 1843, but the work was not thoroughly taken in hand until the third quarter of the year 1844. Since that time the driving of the tunnel has been unceasingly carried forward, but coupled with many hindrances and difficulties, such as quicksands, immense quantities of water, etc., which have trebled the cost and retarded its completion.

The tunnel is ventilated by eight air-shafts, and lies some 400 feet below the deepest Freiberg water-adit. It has a uniform height of 9.84 feet, with a somewhat smaller breadth. The present length of the adit with its ramifications is 43,000 meters (all of which length is now in use), and will be when completed over 51,000 meters, or 31½ miles. The cost of the tunnel is estimated at 12,000,000 marks or \$4,000,000, and will be paid for by a tax on all the mines which it directly benefits. The gradient of the floor is only 0.03m. in 100 meters. This small gradient may make it necessary to clear the tunnel occasionally, but this can be accomplished without difficulty with suitable boats and dredges. Five miles of this tunnel are perfectly straight, without the slightest curve, and along the whole length the curves are very light. One rather interesting occurrence during the past year was the striking of an old mine, of which no maps are in existence. This mine is probably more than four centuries old, and the timber which had been used as supports, etc., was found for the most part sound. Two new veins were also struck, but only one of them will be exploited. It is rather remarkable that nearly the whole driving of the tunnel has been done by hand, Burleigh drills, driven by compressed air, having been introduced only within the past year. The rock throughout nearly the entire length is solid gneiss, which accounts for the great time that has been taken to the work, it being necessary, with hand boring, to put in as many as from 40 to 50 holes to the face.

The necessity for the continued prosperity of the Freiberg mines, which have now been worked for about seven centuries, may be gathered from the fact that at the present time there are more than 6,000 laborers, with their families, amounting altogether to some 20,000 persons, who derive sustenance from the mines and metallurgical works connected with them. It may reasonably be expected that the Rothschoberger tunnel will give fresh impetus to the Freiberg mining, and considerably augment the output of ore, which has of late years somewhat fallen off, owing to the immense quantities of water which continued to flood the mines, and prevented the veins of ore being followed and worked below a certain depth.

Saxony may well, and justly be proud of a tunnel which is without doubt the longest in the world, and which has required so much time, perseverance, skill and labor as the Rothschoberger water-adit.

### Inland Sea in Algeria.

MM. Dumas and Danbree have urged several objections, says the *Engineer*, to the proposed artificial inland sea in Algeria, and agree with M. Naudin, who read a paper on the subject at a recent meeting of the Academy of Sciences, that its sanitary effects would be deplorable. It is thought that to fill the shallow basins of the region which it is proposed to convert into a sea with salt water would be equivalent to reproducing in Algeria all the worst features of marshy plains. Captain Roudaire, who proposed the scheme, admits that even in the center there would be nowhere more than about 80 feet of water, and the whole coast line would have so little water that it would be little better than a sandbank with an admixture of salt and fresh water, upon which the strong tropical heat would act in the most deleterious manner for two-thirds of the year, causing a rapid decomposition of organic matter, and spreading contagion for miles in every direction. M. Naudin considers that there is no similarity between this district and Egypt, the climate of which country has been much improved by the creation of the Suez canal and the plantation of trees; for, according to him, while Egypt lies between two seas, and is traversed by an immense river which has pericidal overflows, the Algerian district is far from the sea, and is bounded by arid deserts.

A CITY UNDER A LAKE.—An engineering problem, as interesting as the laying open of Pompeii, is involved in a strange discovery which is reported from the Lake of Geneva. A tourist having lost his trunk, two divers were employed to search for it. While they were below water they found what they supposed to be a village, since covered by the lake. Their statements led to the investigation of the spot by the municipal authorities, who took measures to ascertain the truth of the extraordinary account of the divers. On covering the placid surface with oil, these latter were able to distinguish the plan of a town, streets, squares, and detached houses marking the bed of the lake. The ruddy hue which characterized them led the observers to suppose that the buildings had been covered with the famous vermilion cement which was used by the Celts, Cimbris and the early Gauls. There are about 200 houses arranged over an oblong surface, near the middle of which is a space more open, supposed to have been used for public assemblages. At the eastern extremity lies a large square tower, which was taken for a rock. A superficial investigation seems to indicate that the construction of these buildings dates from some centuries before our era. The Council of Vaud has decided to have the site of the dwellings enclosed by a jetty stretching from the land, and to drain off the water, so as to bring to light what promises to be one of the most interesting archaeological discoveries of the present time.

THE NEW U. P. TERMINUS.—We read in the *Railway Age* that the long and anxiously awaited decision as to the legal terminus of the Union Pacific railway, having finally been given in favor of Council Bluffs, Iowa, that company have now commenced the erection of a grand depot building on this side of the Missouri river. The building will cover an entire square of ground one mile from the river and two miles from the bluffs proper, the site being the high bench of land east of Spoon Lake, immediately northeast of the present temporary depots. The building—in style English Gothic—will be of stone and brick; the outside facing, Omaha red pressed brick, with cut-stone trimmings; the roof to be covered with slate. The structure will form three sides of a quadrilateral. The main building, which faces east, is 210 feet long, 60 feet deep, and two stories in height, besides a mansard roof. From each end of the main building extends backward a wing 40 feet wide and 120 feet long, inclosing a court 130 feet wide and 120 deep. The wings are of one story, 20 feet in height in the clear, corresponding to the first story of the main building. The external measurement of the whole structure is 210 feet front and 180 deep. The court will contain four tracks, with covered platforms between them, for the arriving and departing trains of the Union Pacific.

ST. LOUIS PROJECTS.—An exchange says: "We are gratified to learn that the committee appointed by the Narrow-Gauge Convention will open an office and commence at once the work of organization and canvassing for subscriptions. The news from the interior is very encouraging along the whole line. The people are aroused and enthusiastic in favor of the work, and are prepared to subscribe money, material and lands to the construction of the road. We hope to see active and energetic men at work very soon, soliciting subscriptions to the work in St. Louis. In the same connection we must express the hope that before its recess the City Council will also take some action in behalf of the River and Rail Transit Company. The need of outlet from the Union depot to the river by tunnel, which the company proposes, is pressing felt. The company is already organized; the names of its members give ample earnest of the success of the undertaking. Let the Council act as quickly as possible."

RAILWAY BUILDING AND EARNINGS.—According to Mr. Poor's figures, the total mileage construction, at the close of the year 1876, was 77,470 as against 74,658 in 1875. The number of miles in actual operation, however, is reported at 73,508, leaving 3,962 miles of which no operating returns are given. There is an apparent increase of 1,749 miles operated in 1876 as compared with the previous year, and an increase of 2,812 miles in the total construction. The increase in construction over that of 1874 and 1875 is attributed mainly to the progress made with the Southern Pacific lines, and the narrow-gauge activity in Texas, Colorado and Ohio. No new lines of any magnitude have been undertaken. The gross earnings of all the roads show an apparent decrease of \$5,807,546, while the net earnings show an increase of \$946,314, a result that can only be accounted for by a greatly increased economy in operation; but whether this has been at the expense of the condition of the roads is a matter of conjecture. The causes of the falling off in gross earnings are sufficiently obvious. The dividends for the years ending at various dates during 1876, show a falling off of \$6,254,540 as compared with the previous year's reports, notwithstanding the increased net earnings.

SOUTH AMERICAN RAILWAYS.—Peru's example is catching all over South America, and the continent seems to be on the verge of a general revival of railway building. All the old plans are again up for discussion. One of the most interesting is that for a road from Buenos Ayres to the Pacific at Santa Rosa, Chili, which will tunnel the Andes at a height of 10,500 feet, the perforation being two miles long. It is now under debate in Congress of Buenos Ayres.

A DIRECT cable communication is to be formed between Sweden and Russia, the stations being Grisslehamn and Alaud.

### Arizona Mines.

The *Arizona Citizen* is indebted to Governor Safford, who has recently examined the mines north of Florence, for the following interesting mining items:

Most of the work in the Silver King mine is suspended for the present, for the reason that the company have upon their dumps more ore than can be concentrated in the next twelve months; and as there is no other machinery for working or reducing these ores there is neither room nor profit in piling it upon the dumps. The mine never looked more promising than it does at this time. The concentrator works to a charm, and two more of these machines have been ordered from San Francisco.

The Silver Bell, located about five miles from the Silver King, and owned by Whitlow & Co., is being rapidly developed, showing a large and exceedingly rich lode. It bids fair to rival the celebrated King.

Several other mines in this district are being prospected with good results. A number of locations have recently been made in the Superstition mountains, about 12 miles northwest from the Silver King, which give promise of becoming valuable mines. Seven miles north of Camp Pinal a promising mining district is being opened. One of these mines was recently sold to a San Francisco company. Active prospecting is being carried on in the main Pinal mountains, and two new mining districts have recently been formed on the western slope of them. There are now about 25 miners at work in Mineral Creek district, with the most flattering prospects. The lodes are large and well-defined, and the ore assays from \$100 to \$1,000 per ton in silver. One man has several tons on the dump that gave an average assay of \$900 per ton. These mines are located about 40 miles from Florence, near the Gila valley. Another district still east of Mineral creek has been organized by Putnam and others. Nuggets of nearly pure silver are frequently found in this district, that seem to have been broken off and detached from the lodes, and as far as the lodes have been prospected, they show very high-grade ore.

Explorations in Globe district have been extended through the mines to about 20 miles in length by at least 12 in width. A belt of mineral has been discovered running from Pinal creek in a northeasterly direction about 20 miles. Locations have been made upon this belt nearly all the way, and quantities of nearly pure silver have been taken out at various points the entire distance. The most notable locations are the mines in Richmond basin, owned principally by McMorris, Styles, Dickey, Chilson Bros., Miller and others.

The Stonewall Jackson location is near the northeastern end of the belt, and is probably the richest discovery yet made in the district. The owners, McMillan & Harris, have sunk a shaft on the foot-wall 70 feet deep. They have found a continuous crevice following the wall of metal, which is about 80% silver. From this shaft they have taken out already, without drifting or stoping, about \$80,000 in silver, and at the bottom of the shaft the silver crevice is wider and quite as rich as at any other point. Between the foot and hanging walls, and above this silver crevice, there appears to be a large lode of low-grade ore, and such seems to be the condition along the entire belt; but, so far, most of the developments have been confined to following the rich crevice.

The owners of the Sherman mine, about five miles from the Stonewall, boast of having taken out the largest silver nugget, one piece

weighing 450 pounds, supposed to be at least half silver.

Richmond Basin has been perhaps the best poor man's camp in the district. The Chilson Bros. have taken out and shipped at least \$50,000 worth of ore, running into the thousands per ton. McMorris & Styles took \$10,000 from a shaft less than 40 feet deep, and the prospects are better as they go down. Alwayney & Dickey, Miller & Co., and many others have also taken out large quantities of rich ore. The future wealth of this district will consist of the lower grade ores, that will pay a fair margin above the expense of mining and milling, as this will give employment to a large number of people and distribute the money.

Two new mills are in process of construction; one at the Champion mine, by J. D. Wilson & Co., and one at the forks of Pinal creek, by Townsend & Co. When completed, they will be in every respect first-class mills. It is believed that these mills will be kept constantly at work in good ore, and if so, they will give life and value to these mines not heretofore attained, and the stream of bullion they will constantly send to San Francisco will do much to attract attention to the whole Territory.

There are two small mills at present running in the district, and as they work high-grade ores, a considerable amount of bullion is constantly being taken out, the larger portion of which is sent east to Silver City and Mesilla to pay for goods purchased in that section; hence, Arizona loses credit for the bullion that is sent in that direction, and New Mexico gets it. As we mainly have to depend upon California for mining machinery and money to develop our mines, it would seem to be to the interest of those engaged in mining and milling to send their bullion where the Territory will get credit for it.

A furnace is being erected at Globe City for the reduction of copper-silver bearing ore, of which ore there is a large quantity in the neighborhood; in fact it would seem as if the eastern side of Globe district would be able to supply all the copper needed by the world. Globe City is improving. There are several stores doing a successful business and a few new houses being erected.

It is believed that a new town of some importance will be erected at the forks of Pinal creek, where Townsend & Co. are erecting their mill. It is located about four miles below Globe City, and is very centrally situated to the principal mines of the district.

### The Rocky Mountain Mill.

It gives us great pleasure to announce that this mill, destroyed by fire on the 31st of March last, has been rebuilt by Messrs. Mathews, Morris & Co., and is now open for business. The former mill machinery included a set of wet concentration works. The present works consist of crushing and sampling machinery only.

The mill building proper is a strongly built frame structure 40x60 on the ground, one-half of which is two stories, giving an upper floor 20x60 in addition to the ground floor. The ore is received upon the upper floor by an elevated timber and plank roadway running from Brownelle street, which is nearly on the same level, along the side and down past the end of the building, ending on Third street. This upper floor is divided by suitable bins, etc., and contains a Dodge crusher. Passing the crusher the ore falls into the rolls for finer crushing. These are of the Frazer, Chalmers & Co. pattern, 10 inches in length and 22 inches in diameter. Here the ore is sampled by hand work, and the sample will be put through finishing rolls standing near, on the lower floor. From here the sample is taken to the grinding room, which is separated from the customer's waiting room by a glass partition, where the grinding and final sampling may be seen if desired, but not meddled with. On the lower floor are the large Fairbanks scales, and ample room for storage of the crushed and sampled ore. The power is furnished by a 10x20 engine, driven by an upright boiler set outside the main building. The assay office was not rebuilt upon the old site, but adjoining the office which was saved. The assay office, built by Messrs. Dillingham and Higbee, is a model of convenience.

Although just getting ready to start, there are 400 sacks of ore in the mill waiting for sampling, and much more might have been taken but for the fear of keeping customers waiting. They commence crushing to-day. The new building and machinery have been put up by Mr. Conrad Hanson.—*Georgetown Courier*.

AUSTRALIAN CANNEL COAL.—A discovery has been made in Australia which confirms with singular minuteness the theory that assigns to cannel coal an origin from leaves. It is difficult to understand how leaves can accumulate free from dirt in sufficient quantity to form the beds of cannel coal, now several feet thick, and representing many times their mass in leaves. But in Australia just such a mass of leaves has been found, partially but not completely altered to cannel. The appearance and fracture of fresh blocks are the same as of this kind of coal found elsewhere, but after several years' exposure it can be separated into thin laminae, which shows that the mass is composed principally of leaves. The bed is six feet thick, and the government geologist calls it "incipient lignite."

A LARGE number of American manufacturers have just been awarded premiums at the Australian International exhibition.



## The Empire Mine, Idaho.

The Owyhee *Avalanche* says: Operations at the Empire mine have been temporarily suspended. The men working there were much dissatisfied at not receiving their monthly pay on the 10th, as usual; and not receiving satisfactory assurance that it was forthcoming immediately, they resolved to quit for a few days. They have charge of the works in the meantime, and if no change for the better occurs in a few days, they will proceed to work the mine themselves. We are, however, reliably informed that money is now on the way from San Francisco wherewith to pay the men, and that the mine will start up again in a day or two. Mr. Crutcher is reported to have left that city on Thursday morning, and has funds with him. There have been various reports in circulation relative to the progress of work in this mine during the past few weeks, and it is just possible that there may have been some "skulduggery" going on, but we have been unable thus far to get at "bottom facts." Whatever may be the upshot of it, it may be set down as a certainty that men will not now or hereafter work in our mines unless paid up within 10 or 15 days after the end of each month. They are perfectly right in taking this stand, as many miners here and many who have left us have realized from sad experience the losses and uncertainties attendant upon waiting six and eight months for pay which they never got. The miners are the bone and sinew of the country, and it is through their labors we expect to have our mines developed and the camp become prosperous again. They should consequently be paid promptly every month for their services, the same as a merchant pays his clerks, or the same as any prompt business man discharges such obligations to faithful employees. In such a mine as the Empire there is no good reason why there should be any delay in paying the workmen. The yield of rich rock has been good for the past three months, and while the management has not been as economically conducted as we think it should have been, it must be generally conceded that it is for the interests of the company and all concerned to have the work pushed forward in a practical and business-like way and the mine legitimately developed. The experience of the past few years has shown that we are sadly in need of outside capital to develop our mines; and, where this is furnished, it is the duty of every corporation to insist upon a judicious system of management, and that the work shall be so conducted that every transaction shall be capable of bearing the most rigid scrutiny. There has been considerable dead work performed in the upper levels of the Empire during the past six weeks, and it more than probable that this has something to do indirectly with the delay in paying the workmen. Whatever the trouble may be, there should unquestionably be a proper understanding between parties below and parties here, so that work should go on smoothly, and the rock upon which we have split so many times in this camp be avoided if possible. The Empire is good property and ought to yield handsome returns to its owners.

## Partners in Mines.

A matter of great importance to any person who is going to apply for a patent on a lode where there were at one time partners, but the partners having failed to perform their proportion of the annual work, is at the time of application an individual enterprise, will be found in the recent decision of the Department of the Interior given below:

**Proof Required in Application for Patents.** Where proceedings were had against co-owners of a mine who failed to pay their share of the required expenditure under section 2324 of the Revised Statutes. Full decision as follows:

"Where a party proceeds against one or more of his co-owners under section 2324 of the Revised Statutes of the United States, he must file with his application for patent a copy of the original notice of location and abstract of all conveyances made of the claim; a copy of the notice published to delinquent co-owners (which notice should embrace the names of all delinquents), to which must be attached the affidavit of the publishers of the paper in which the notice was inserted, that the attached notice was published for 90 consecutive days (giving dates); the affidavit of the claimant or claimant who have made the required expenditures (corroborated by the sworn statement of two or more disinterested witnesses), showing the character and extent of the claim, and the time when such improvements were made. There must also be filed the sworn statement of the claimant or claimants who have made the required expenditures as to whether or not either of the parties whose names appear in such published notice contributed his proportion of the required expenditure either during the 90 days' notice by publication or the succeeding 90 days. The evidence must be full, positive and explicit on all these points."

**THE GREAT GUN.**—"I hear," says a writer in *Mayfair*, "that Russia has bought the largest gun yet manufactured by Krupp. The giant was formerly at the Philadelphia Exhibition, and nearly wrecked the steamer *Essex*, which conveyed it to Russia. Its bore is 14 inches; the charge consists of a steel shell of 1,254 lbs., with 302 lbs. of prismatic powder; its velocity is 1,590 feet in a second."

## USEFUL INFORMATION.

## Killing Cattle with Dynamite.

An interesting experiment, says the *Pall Mall Gazette*, was made last week at a hereslaughting establishment at Dudley, with a view of testing a new system of slaughtering cattle by means of dynamite, and thus putting them out of existence more speedily and with less suffering than by the ordinary pole-axe.

Two large, powerful horses and a donkey (disabled for work) were ranged in a line about half a yard apart under a shed, the donkey being placed in the center. A small primer of dynamite, with an electric fuse attached, was then placed on each side of their foreheads and fastened in position by a piece of string under the jaw. The wires were then coupled up in circuit, and attached to the electric machine, which stood about five yards in front. The handle of the machine being then turned, an electric current was discharged, which exploded the three charges simultaneously, and the animals instantly fell dead without a struggle.

The whole affair was over in two minutes, and the experiment appears to have been a perfect success. It was conducted by Mr. Johnson, agent for Nobel's Explosive Company, Glasgow, assisted by Mr. Harris, one of the dynamite instructors. By this means, it is stated, any number, even a hundred or more cattle can be killed instantly by the same current of electricity. There cannot be a doubt that the present system of slaughtering cattle is open to the charge of being cruel and barbarous, and the slightest want of skill on the part of the slaughterer often subjects the unhappy beasts to horrible torture. Any attempt to extinguish life painlessly is a step in the right direction, not only as regards cattle, but as regards criminals sentenced to capital punishment, whose case equally deserves consideration.

**WINGS AGAINST STEAM.**—A short time ago there was a race from Dover to London between the Continental mail express train and a carrier pigeon, conveying a document of urgent nature from the French police. The pigeon, which was bred by Messrs. Hartley & Sons, of Woolwich, and "homed" when a few weeks old to a building in Cannon street, City, was of the best breed of homing pigeons known as "Belgian voyageurs." The bird was tossed through the railway carriage window by a French official as the train moved from the Admiralty pier, the wind being west and the atmosphere hazy, but with the sun shining. For upwards of a minute the carrier pigeon circled round to an altitude of about half a mile, and then sailed away towards London. By this time the train which carried the European mails, and was timed not to stop between Dover and Cannon street, had got up to full speed and was proceeding at the rate of 60 miles an hour toward London. The odds at starting seemed against the bird, and the railway officials predicted that the little messenger would be beaten in the race. The pigeon, however, as soon as it ascertained its bearings took the nearest homeward route, in a direction midway between Maidstone and Sittingbourne, the distance "as the crow flies" between Dover and London being 70 miles, and by rail 76½ miles. When the Continental mail express came into Cannon-street station, the bird had been home 20 minutes, having beaten her Majesty's Royal mail by a time allowance representing 18 miles.

**PRESERVATION OF EGGS.**—The *Journal of the Medical Academy of Turin*, in a recent number, says: The sure and simple method of keeping eggs sound by smearing the shells with linseed oil has long been practiced. The oil forms a sort of film over the shell, thereby preventing the two immediate causes of decomposition—evaporation from and penetration of air into the egg. A recent experiment in point deserves notice. A dozen new-laid eggs were rubbed over with linseed oil applied with the tip of the finger; another dozen were coated in like manner with poppy oil; two more eggs were left in their natural state. The whole 26 were then laid close together, in three rows, on dry sand upon a shelf, where they were left undisturbed. At the end of three months they were weighed, and again at the end of six months, when they were opened. The two eggs left in their natural state at the end of three months had lost 11% of their weight, and at the end of six months 18%, and were found to be half empty and the contents rotten. The eggs coated with poppy oil in three months lost 3%, and in six months 4½% of their weight. The eggs were still full and devoid of unpleasant smell. The eggs rubbed over with linseed oil in three months lost 2%, and in six months 3% only of their weight, and when opened were found to be full, with the smell of fresh eggs.

**BRASS LACQUERING.**—If you want a good deep gold lacquer you should make up a small stock bottle, holding, say, half a pint, according to the following recipe. You can then add as much as may be required for the tint you wish to get: Alcohol, ½ pint; dragon's blood, 1 dram; seed lac, 1½ oz.; turmeric, ¼ oz. Shake up well for a week, at intervals of, say, a couple of hours; then allow to settle, and decant the clear lacquer; and if at all dirty, filter through a tuft of cotton wool. Mix with the pale lacquer a day or two before you wish to use it.

## Notes on Steam.

*Saunders' Journal* instances the following: Steam arising from water at its boiling point is equal to the pressure of the atmosphere, which is 14.72322 lbs. at 66° upon a square inch.

In all calculations concerning steam it is necessary to have some or all of the following elements, viz:

Its *pressure*, which is termed its tension or elastic force, and is expressed in pounds per square inch.

Its *temperature*, which is the number of degrees of heat indicated by a thermometer immersed in it.

Its *density*, which is the weight of a unit of its volume compared with that of water.

Its *relative volume*, which is the space occupied by a given weight or volume of steam, compared with the weight or volume of the water that produced it.

Steam in contact with water is at its *maximum density*.

Under the pressure of the atmosphere alone, the temperature of water cannot be raised above its boiling point.

The *expansive* force of the steam of all fluids is the same at their boiling point.

A cubic inch of water, evaporated under the ordinary atmospheric pressure is converted into 1,700 cubic inches of steam, or, in a unit of measure, nearly one cubic foot, and it exerts a mechanical force equal to the raising of 2,120 pounds one foot high.

27,222 cubic feet of steam at the pressure of the atmosphere weighs one pound avoirdupois.

The *velocity* of steam, when flowing into a vacuum is about 1,550 feet per second when at an expansive power equal to the atmosphere. When at 10 atmospheres the velocity is increased to but 1,780 feet; and when flowing into the air under a similar pressure it is about 650 feet per second, increasing to 1,600 feet for a pressure of 20 atmospheres.

**NEW MODE OF REPRODUCING DESIGNS ON GLASS.**—A mode of effecting this, which is a modification of the process by which copper-plate engravings on paper are transferred to porcelain, has been invented in France. As fine-line copper-plate engraving would not adhere to glass, others having considerable depths are used; also, to impart to the enamels that thickness which the glass requires, stearates and oleates are added to the silicates and borosilicates, which serve to support, or to fuse, the colored or coloring oxides; and for a vehicle, a solution of resin, in ether or benzine, is added to the mixture. Impressions, taken mechanically on paper, with this ink, from engraving rollers, are transferred to the glass, which is then treated as in similar processes with porcelain, and is finally placed in the furnace. Effects of great artistic merit are thus obtained at a trifling cost.

**BRAZING BARR SAWS.**—Good brass rich in copper is generally used. Bring the two ends of the saw close together and fasten; then take a small pan of charcoal, and place it under the ends and direct the flame of a blow-pipe on it. As the ends will soon become red-hot, sprinkle some powdered borax upon them and add the solder with a piece of iron. The way to make the solder melt: three parts of brass filings with one part of silver; cast in ingot and file away; collect the filings, and put into solution of sal-ammoniac in water, and so keep until wanted.

## GOOD HEALTH.

## Caisson Disease.

Most readers are doubtless unaware of the fact that Mr. Roebling, the well-known engineer and suspension-bridge builder, is the helpless victim of a malady called the caisson disease. The *New York Sun*, in a recent note on the East river bridge, says: One singular fact about the construction of the great bridge is that its chief engineer, who has conceived it in all its details and has directed its construction week by week, and almost daily, has seen less of the bridge than any resident of Brooklyn or New York who has crossed the ferry. Mr. Roebling has not been near the structure for three or four years. He is a victim of the caisson disease, which afflicted so many of the men employed in sinking the great caissons on which the bridge towers stand, and it is not expected that he will ever recover from it. This malady is defined as being a disease depending upon increased atmospheric pressure, but it always develops after the pressure is removed. The pressure in the New York caisson, when it was about 78 feet deep, was 36 pounds to the square inch. This work being the most important of all, Mr. Roebling, although knowing its perils, repeatedly visited the depths of the caissons personally.

The result is that he is stricken down for life with a disease which is practically incurable. In his case, besides the usual pain in the extremities of the body, he has become paralyzed, and his nervous system is greatly impaired. Last fall, when it became necessary to remove him from his home in Trenton, N. J., to Fifth street, in this city, he was put in a canal boat and drawn by a tug to the point nearest his residence. He was unable to travel in any other

way. A few weeks ago he was removed to his residence at 110 Columbia Heights, Brooklyn, in the same way. He was carried on a stretcher to the canal boat, and placed on the dock. As he was drawn up the East river by the tug, he saw the completed towers and the temporary foot bridge for the first time. "Ah," he said, "that's just as I expected to see it." He is unable to leave his residence, and his staff of engineers receive instructions almost daily from him.

**HINTS TO STUDENTS.**—"Sleep is the only entire and absolute cessation of the mental and bodily expenditure; and perfect or dreamless sleep the greatest cessation of all. Whatever shortens the due allowance of sleep, renders it fitful and disturbed, or promotes dreaming, is so much force wasted. In the waking hours there may be cessation from a given exercise, with more or less of inaction over the whole system. The greatest diversion of the working forces is made by our meals; during these the train of thoughts are changed, while the body is rested. Bodily or muscular exercise, when alternated with sedentary mental labor, is really a mode of remission accompanied with an expenditure requisite to redress the balance of the physical functions. The blood has unduly flowed to the brain; muscular exercise draws it off. The oxidation of the tissues have been retarded; muscular exercise is the most direct mode of increasing it. But definite observations teach us that these two beneficial effects are arrested at the fatigue point; so that the exercise at last contributes not to the refreshment, but to the exhaustion of the system."—*Popular Science Monthly*.

**WHAT TO EAT IN SUMMER.**—Dr. W. H. Vail publishes an article on summer diet, and makes the following argument: "God, in his providence, has stocked the polar regions with the seal, the whale and the bear; all the personification of fat and oil—while vegetation is comparatively unknown. On the other hand, as you approach the tropics, oranges, bananas, lemons, and all our luscious fruits greet you on every hand, and vegetation runs wild. This disposition of Providence teaches us—what our appetites confirm—that in cold weather our diet should consist mainly of oily substances, or such food as is converted into fat by the process of digestion; while in the summer we should select such articles of diet as are not convertible into fat." Dr. Vail adds that vegetation, the edible parts of which ripen underground, such as potatoes, carrots and parsnips, are heat-producing, while those that ripen above ground are cooling. The latter, including especially asparagus, lettuce, peas, beans, tomatoes, corn and all fruits, should be freely eaten. Meat should not be eaten oftener than twice a day, and lean is preferable. He particularly recommends tomatoes.

**DISINFECTING THE DOCTORS.**—Dr. Seaton, medical officer of health, remarks in a late lecture: There are many occasions where the clothes of the medical attendant require disinfection, as, for instance, after visiting a group of smallpox or scarlet fever patients. Where the practitioner has been unfortunate enough to have a patient with puerperal fever under his care, the linen requires to be boiled, and the other things barked, before being worn again at a labor. But it is to the bands that he must pay special attention, and it is here that the disinfecting properties of chlorine are particularly useful. The hand should be well soaked three or four times daily in the chlorinated soda (P. B.). If this is done for a week, baths used at the same time frequently, and the clothes disinfected, practice may be resumed without danger. Length of absence will not compensate for a neglect of these precautions, as the practitioner may communicate the disease after many months.

**HYPOSULPHITE IN DIPHTHERIA.**—A very large number of diphtheria cases are cited by a Boston physician as having been successfully treated, in his own practice, by the use of hyposulphite of soda, in doses of from 5 to 15 grains or more in syrup every two or three hours, according to the age and circumstances; as such as the patient can bear without physicking being a good rule in the severer cases. The tincture can be used in doses of five drops to half a drachm, in milk, the amount for thorough stimulation being greater than can be taken in water; and, in the treatment of children, the milk thus used answers for food. As, however, the hyposulphite prevents the digestion of milk, it should not be given in less than an hour from it, though they may be used alternately in frequent doses.

**A WISE DECISION.**—At a late meeting of the New York Board of Health, a communication was received from the Board of Police in respect to a proposition of a firm of disinfectant manufacturers to disinfect the garbage and street dirt with a mixture of carbolic acid and copperas, at the place of final deposit, and requesting the opinion of the Board as to whether the garbage and street dirt so treated is suitable for filling purposes within the city limits. The Board decided that the disinfection of the material with the preparation referred to renders it less offensive, and that it may be safely used in the filling-in of bulkheads and docks; but it cannot, they say, be safely used in localities likely at any time to be occupied by dwellings or factories.





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## The Week.

As will be seen by the account in another column, the week has been characterized by the occurrence of a number of mining accidents, in several instances fatal. It seems impossible to place safeguards in such a way as to entirely overcome the dangers of mining, and these accidents come upon the miners usually in a bunch, as it were. We note this week a good strike in Tybo District and another in Calaveras county; but where one is needed most is the Comstock; although some of the features of the mining aspect are favorable, there has been no important strike. We give a statement elsewhere of a very important matter in connection with labor questions on the Comstock, where an amicable understanding between superintendents and miners has been arrived at without much debate or trouble. The point gained by the Miners' Union is an important one for them, showing that the organization must be a strong one or it could not have been carried so easily. However, as all interested are satisfied and have decided the matter amicably, it is nothing in which the public generally have anything to say, and interminable discussions on the subject are nipped in the bud.

The exciting theme of the passing days is next week's elections. The press of the State is lashing itself into a fury, from which we suppose a clearer and surer safety to us all will eventuate, as wine is clarified by its working. In the contests now in progress we have no hand or voice as a journal. Not that we do not appreciate the duties of citizenship; not that we do not sincerely desire the well-being of our State. Our work is in another field, and here we stand ready to do good service for our readers, both now, when the storm without is at its height, and afterwards, when the minds of all shall return again to the promotion of noble, practical and progressive industries.

## Prospecting Old Ground.

Every now and then we hear of a new mine having been found in a locality where mining has been carried on for many years, and where all the mines were supposed to be worked out. As a general thing it is some new-comer who makes these strikes; some one who leaves the beaten track, or who, following it, has what the miners call "greenhorn luck," and tumbles over what experienced men have looked for in vain. Instances of this kind are by no means rare, particularly in California, where extensive tracts of ground were prospected and worked over in early days in a careless sort of fashion; when a dollar was of not much more importance than a 25 cent piece is now. This sort of ground having been worked, prospectors look for new fields, not caring to risk much time in gleaning where the bulk of the harvest has been reaped. Of late, however, those who mined in the early times have called to their remembrance certain promising indications or chances, and have gone back to look them up. Lots of claims have been re-located, within the past year, under these circumstances, and many more, because, with more economical views and better experience, they could be made to pay; whereas, with high-priced labor, costly manipulation, and extravagant expectations, the miners of 10 or 15 years ago would not touch them.

Perhaps, after all, the circumstances are rather more encouraging than otherwise. A number of small mines, giving independent employment to a half dozen or so men and worked in partnership for the profit to be made from them, are of infinitely more advantage to the country than a few worked by large companies. In one case the profit is scattered among a class of people who need it, will appreciate it, and spread it in various channels in the locality from which it is obtained; in the other, the profits are absorbed by a few individuals and added to the wealth already hoarded up, to be used at cent. per cent., and in a way to be of little real benefit to the community.

The miners who take up these old, abandoned claims, or find new ones in old ranges, are generally men who work the claims themselves, with the help of a few others. Although the hullion products of such ventures are comparatively small, in the aggregate they swell to material amounts; and it is encouraging to note the number of men who are able by this means to keep steadily at work. It takes energy and hard work to get anything out of an ordinary quartz mine after it is found; but it is much more pleasant for a man to keep steadily at work for himself, even if it is hard, than to labor for somebody else whenever he gets a chance. These small mines will make a more prosperous interior for this State than many think, and give vigor again to many camps which were supposed to be worked out and dead. The prospectors who took up the mines of late for lack of anything else to do, have opened many an old claim and found many a new one, and they are hard at it yet all over the country.

## A Strike in Calaveras County.

One of those ledges for which people have searched for again and again was found a few weeks since in Calaveras county, after the ground had been thoroughly prospected by various parties for the past 12 or 15 years. In the placer-mining regions of this State, when the gulches and ravines were worked out, the miners started in to look for the ledges which furnished the gold found in the creeks. In very many instances they were found in the hillsides near by, and again no traces were discovered. Where, however, they found rich pieces of quartz only slightly abraded and worn, they naturally concluded that the purest ledge must be close at hand, and, in such cases, always searched diligently for it.

This was the case at Corral gulch, near El Dorado, on the road to, and about four miles from, Sheep Ranch mine, in Calaveras county. The gulch was rich, but was worked out years ago. While it was worked, many handsome, rich quartz specimens were found, and frequent searches were made for the ledge from which they came. A lead was found on the hillside near by, some time ago, but it never paid; still, as no other was found, most persons concluded that this was the one. This belief was not shared in by all, however, as what follows will show.

Two miners, named Lambing and Durst, the former of whom was here in early days, and who has since mined in Colorado, Wyoming, and all over the coast, but returned to California not long since, went up to Calaveras county to prospect. They leased a mine and bought a little eight-stamp mill, on Murry creek, about two and half miles distant, in what they considered a good locality. Seeing some of the rich quartz found in the gulch, and comparing it with the rock found in the ledge above, they saw considerable difference, and came to the conclusion to buy the ground above and prospect for the ledge. With rare good luck they struck the long-looked-for ledge the first day they tried for it, and have been amply repaid already.

The rock is remarkably rich in gold, so much so that considerable of it has been sold here to jewelers for specimens. We saw a sack of this rock, this week, intended for jewelry, brought to the city by Mr. Lambing, and it was such as to make any miner's eyes water; if assayed, it would run into figures we should be afraid to mention.

The ledge has been stripped for 120 feet, and shows specimen rock of the character named all along. At 440 feet from the end of the stripping, it was uncovered again, and, although showing no free gold, it all prospects well, and will, perhaps, average about \$25 per ton. Mr. Lambing does not think it a shoot, but a true vein. The ledge is from 15 to 30 inches in width, the latter at a depth of thirty-four feet. The shaft is on the extreme end where they uncovered the vein. The mine was found only a little over a month ago, and, with 10 men, they have taken out 50 tons of rock. The specimens referred to were found near the surface, and, as far as stripped, it shows free gold. The mine has been named the Hero, and, if "it keeps up its lick," will make a record for itself.

There are a number good ledges up in that vicinity which are paying well, we are informed. The Greek mine had a crushing of about 100 tons of ore, recently, part of which yielded \$34 per ton and part \$19.50. The Horsethief claim pays from \$15 to \$17 per ton, its ore being worked in an arastra. It is a large, well-defined ledge. A test crushing from the Dughie mine showed a result of \$12 per ton.

## Mining Suits.

One day this week Louis Kaplau was fined \$100 by Judge Wheeler for contempt of court in assuming to act as Secretary of the Mahoney mining company in defiance of an injunction issued by the Nineteenth District Court. On the 23d of June, Judge Wheeler issued an order restraining Ignatz Steinhart, S. Heydenfeldt, P. N. Lilienthal, Otto Eselie, F. A. Benjamin and Louis Kaplan, their agents or attorneys, from acting or attempting to act as Directors, Secretary or officers of the Mahoney mining company. The order was issued upon the petition of William Stewart and others, for whom T. I. Bergin appeared as attorney. Mr. Bergin said that Kaplan, disregarding and ignoring the decree of the Court, and acting under the advice of counsel, which he accepted as paramount to the restraining order, had assumed to act as Secretary and insert advertisements, institute suits, and perform other duties of that office. Mr. Sharp, attorney for Kaplan, said that the opposing party had forcibly taken the books away from the Secretary's office, and with the books took 200 shares of stock. He contended that Mr. Kaplan was Secretary until his successor had been chosen, and was the rightful custodian of the company's records, and had the power to institute suit to recover property.

Mr. Kaplan was called to the witness stand, and said: I was served with a copy of the restraining order. It directed me to refrain from acting as Secretary of the Mahoney mining company. I caused advertisements to be inserted in the paper on the advice of counsel. I did not intend to disobey or disregard any order of this Court. I am a servant of this corporation, and for four years' service I have received \$1,000, while the honorable Senator Stewart has expended \$140,000.

Court—Your action in this matter was in clear and defiant contempt of this Court, and counsel who advised you did so in defiant contempt. I must assume that a gentleman of your undoubted intelligence has sufficient knowledge of language to comprehend the meaning of a restraining order. I cannot believe that you were ignorant. I am satisfied that you acted under the influence of others, and I will therefore make the fine very light. Mr. Kaplan, I will fine you \$100, and give notice that the severest penalty shall be imposed if the restraining order is again violated. I will suggest to you, Mr. Sharp, to use your influence to prevent further violation.

A number of stockholders of the Henrietta gravel mining company, who have become dissatisfied with its management, met in the Police Court-room, this week, for the purpose of discussing their grievances and taking steps to remedy the evils of which they complain. Wm. Sciloss was chosen Chairman; M. J. Blackman, Secretary; and E. Lewesmann, Treasurer. After the list of stockholders had been called, the President stated that the main object of the meeting was to inquire why the promised June dividend had not been paid, and protest against the assessment which had been levied instead. Among the items of expenditures were some \$800 to one of the Directors, \$5,000 upon a note given to purchase the mine, and \$450 for office furniture, which he thought was worth less than \$50. A committee, consisting of A. Blackman, H. Hollis, and E. Camboni, were appointed to examine the books and report at a subsequent meeting, to be called by the Chair.

S. B. Dent has applied to Judge McKee, of the Third District Court, for a writ of mandate against W. B. Chuff, N. A. Westfall and J. M. Buffington, commanding them to exhibit the books of the Blue Gravel mining company. Plaintiff's petition sets forth that the defendants and he are Directors of said company; that a meeting was called; that plaintiff found it necessary to look over the books to enable him to act understandingly, but the defendants refused to allow him a sight of the same. The writ was granted.

## Past Product and Profit of Precious Metal Mining.

In the *Engineering and Mining Journal* there appeared, not long since, an article wherein the profits that have attended the business of gold and silver mining in this country were briefly considered. While the conclusions arrived at by the writer were, in the main, correct, he appears to have fallen into several minor errors that call for correction. For instance, he assumes that if this business has, as a whole, proved profitable, it follows that a majority of individual ventures must have paid. This position is clearly untenable. Of the many who, first and last, have invested in the silver mines of Nevada, not one in ten has ever got his money back; and yet the business, as a whole, may be pronounced a success, the gains of the tenth man having been sufficiently large to cover all expenditures and leave a fair margin for profits; this remark applying, though with less force, to California, and other mining countries. But for the large production made by the Comstock lode, mining in Nevada would have proved a signal failure; and had it not been for the discovery of the last great bonanza at Virginia City, the business even here, in view of the money expended, would have been able to make but a very poor showing.

Again, says the writer, almost all the capital invested in this branch of mining—estimated by him at \$360,000,000—has come from the Eastern States and Europe. Whatever the amount of money obtained from that quarter, certain it is, the inhabitants of the several mining States and Territories have also invested heavily in this business, their contributions having been larger, no doubt, than those of all other investors combined.

In this article, the number of miners actually at work throughout the entire West is set down at 25,000. This is an under estimate. There are, in ordinary times, over 4,000 miners employed on the Comstock range alone. Not less than 30,000 Chinamen are engaged in mining in this country; wherefore, there must be, at the lowest calculation, as many as 50,000 men at work in the mines and mills throughout the territory west of the Rock mountains, and the number may even be much larger than this. In this State there are known to be fully 20,000.

Having stated the total product of the precious metals, made during the past 27 years, at \$1,850,000,000, this writer remarks that these figures represent only the bullion shipped through regular transportation companies, the considerable amounts carried away by individuals, of which no record has been kept, not being included therein. In this latter conclusion he is again a little at fault, an allowance of 20% having been allowed by those who compiled these statistics on account of bullion transmitted through private hands. The above calculation really covers 28 instead of 27 years. This discrepancy is not, however, of much importance, the omitted year—1848—having turned out only about \$5,000,000 in gold dust. It should also be noted that the grand total, as here set forth, embraces \$30,000,000 received during these 27 years from British Columbia and \$6,000,000 brought to this port from Northwestern Mexico. To be accurate, therefore, the value of the precious metals turned out on our own territory had amounted, at the beginning of the present year, to \$1,814,000,000, omitting some \$27,000,000 or \$28,000,000 produced in the southern Atlantic States. If this last item and the yield of the current year to date be added to the bullion before turned out, we have the sum of \$2,000,000,000 to represent the value of all the gold and silver heretofore produced within the limits of the United States.

The author of the article under notice estimates the cash value of all our gold and silver mines at \$150,000,000, and of our mills and reduction works at \$200,000,000—a very moderate calculation certainly. The amount of money invested in our mines is by him set down at \$360,000,000; all, as before stated, assumed to have been obtained from the Eastern States and Europe. The value of the labor expended, all put in by the inhabitants of the mining districts, is fixed at \$324,000,000, and the value of the personal assets, being goods, teams, etc., brought into these districts from abroad, at \$25,000,000, making a total investment for which the mining interest is to be debited, of \$709,000,000. Against this we have bullion produced, \$1,850,000,000, and created values represented by mines, mills and reduction works, \$350,000,000; a total of \$2,200,000,000. Deduct from this value of investments made in aid of mining, and we have the sum of \$1,491,000,000 to represent the net profits realized from the business during these 27 years.

According to this data, the annual product of our mines during this period has averaged \$68,500,000. The annual net profits have averaged over \$55,000,000, a rate of interest equal to 13% per annum on the amount invested; the whole of which is probably not much out of the way.

The Academy of Sciences, on Thursday evening, gave a reception to Sir Joseph Hooker, of the Royal Society; Prof. Hayden, of the U. S. Geological Survey, and Prof. Asa Gray, Director of the botanical gardens at Cambridge.

The Combination shaft only lacks 15 feet of reaching the level of the Sutro Tunnel.



## Items of Interest from the Mines.

We give below items of interest from prominent mines, most of which are collated from letters of the respective Superintendents on file at the offices in this city:

In the Imperial they are now cross-cutting east as fast as possible, preparatory to starting joint winze on line between Imperial and Alpha. The cross-cut continues in favorable looking ledge matter, being porphyry with streaks of quartz assaying from \$8 to \$12.

They are retimbering the shaft of the Bullion, between the 200 and 300 feet levels.

The Ophir and Mexican joint winze is down 76 feet.

Letter from the De Fries says: During the week all the claims against the company have been liquidated, and all work discontinued for the present, but sinking the main shaft, which is now 210 feet below the surface. We will open up another level from this depth.

In the New England mine work has been suspended in the winze which was being sunk on the front of the pay chute on account of the strong flow of water. The ledge on bottom of main incline is of an average of two and a half feet thick and of fine quality.

The face of the east drift, 1150-foot level, of the Justice will be substantially timbered as progress is made. South lateral drift, 1000-foot level, is passing through favorable vein matter carrying but little metal.

Cross-cut No. 1 from the 1700-foot level of the Gould & Curry is now very near the ground that compelled the stoppage of the main cross-cut; quite a stream of water is flowing from it.

The operations at the Eureka Consolidated mine, last week, were very satisfactory. There have been extracted and delivered at furnaces 777 tons of ore, taken from the fifth and sixth levels of the mine; the fifth level furnishing about two-thirds, and the sixth level about one-third of the supply. The ore dumps at mine and furnace are full to overflowing. From the present condition of the mine we can extract from 400 to 500 tons daily, and will be enabled to increase upon this amount as soon as we have completed certain changes now being made to facilitate hoisting from the lower levels, where there is an unlimited supply of ore. The bullion product for the week has been 300,559 pounds—a shade less than the previous week. Have shipped about the same quantity.

In the Leopard mine they have had to stop work in the face of 400 and 500-foot levels, until they got the connection made between the 500 and 600 feet, as the air is close. The 600 is in 409 feet, showing quartz and heavy bodies of iron.

The Superintendent of the Coso Consolidated is still taking out ore from the lower winze stopes of good quality. The ledge on the east will average three feet galena ore. On the west the ledge is increasing in width and improving in quality.

Work in the Gila mine is progressing as well as usual. Good headway is being made in cross-cut and drift, with encouraging prospects in both. The stopes are producing some very fine ore, which seems to be increasing every day.

The strike reported in the Hussey mine, on the 22d inst., has been further tested by shaping the drift. In so doing some 200 or 300 pounds of fine ore were taken out. The ledge looks fine and the ore is rich. Haste to connect this drift with the drift from the winze prevent starting drifts on the ore for a day or two; will start them as soon as the main drift is sufficiently advanced.

The developments in the Joe Seates and Geo. Douglass shaft are said to indicate that the shaft is of the identical character of the original Comstock; the water that comes in with the increased depth of the shaft, coming from the ledge itself, proves an extensive ledge, and the pitch corresponding with the parallel Comstock lead.

**LADY BRYAN'S TROUBLES.**—The dissatisfied stockholders of the Lady Bryan mine held a meeting in the Fourth District Court-room on Monday night. It was resolved to place all the stock in the hands of the Secretary of the Safe Deposit Company, subject to the order of the Executive Committee. It was also decided to sell all stock upon which the second assessment levied by the Committee had not been paid, the proceeds to be distributed among the stockholders. An agreement entered into by the Executive Committee was read, not to make any settlement of the suits commenced, nor to receive any moneys tending to that end, without the unanimous consent of that Committee, indorsed by the stockholders at a meeting called especially for that purpose. The meeting then adjourned.

## Betts Spring Company.

Among the flourishing home industries represented at the Mechanics' fair is that of the manufacture of carriage springs. The Betts Spring Co., the only one here exclusively engaged in this branch of business, make a very handsome display of different varieties of springs made, even more creditable from the fact that many original improvements are incorporated in the work.

All of these springs are made of the best refined English steel, which is imported in long bars, from one and a half to four inches wide, the edges being slightly rounded off, ready to make up. As some may be interested in knowing how these springs are made, a brief description of the process is given. A workman takes the steel bars, and a machine cuts them into proper lengths for the leaves of a certain class of springs. The leaf then passes to a furnace, where the ends are drawn out by a machine, very little finishing being required at the mechanic's hands. Each end of the spring is then drawn out thin, leaving a taper from the center to the ends.

The same machine also puts a "lip" on the leaf. This "lip" is a very important improvement over the old-fashioned way of making light springs, and is an invention of Mr. Betts. Formerly, in placing one leaf above another, it was necessary, in order to keep them in position, to cut two slots and punch two teats in each leaf, which, of course, weakened the spring. Each of these slots was about half an

inch long, and, in making the two in each leaf, the piece of steel was frequently broken, and always weakened. The teat or projection in each side of the center of the leaf fitted into corresponding slots in the leaf below it, thus preventing the leaves from getting out of position. The "lip" invented by Mr. Betts is simpler, and answers the purpose better, without weakening the leaf in the slightest degree. It consists of a slight projection formed on the side of the spring, a short distance from each end. This being formed on each leaf, laps down beside each lower leaf, each one assisting to keep the other in position, and preventing lateral motion. These lips, therefore, do away with the slot and teat, and the springs never give way where the lip is. The machine for forming the "lip" was devised by Mr. Betts.

After the "lip" is formed, and the ends are drawn out, the leaf passes to the grinding room, where the ends are "pointed," and any roughness is removed. The leaves then go to the fitting shop, where they are set and carefully tempered. They are then sent to the finishing room, where the parts that show are finished up and polished. Every spring, large or small, is carefully tested before it leaves the shop.

Most of the machinery for carrying out the different operations has been designed by the proprietors, and is of their own construction. The business has been established on the quality of the work performed, no outside assistance having been rendered, and they have succeeded in introducing these springs almost everywhere on the coast. The works were established here some nine years since, with one man and a boy; now they give employment to a large number of hands and supply all the wagon and carriage makers in this city with springs, as well as

sending quantities of them to the interior and all over the coast.

In the display in the fair are shown the different varieties of springs made by the company, some polished up handsomely for exhibition and others in the form usually sold from the factory. A 200-pound weight is arranged to drop on the springs so as to show their strength. This is dropped from different heights, according to the style of spring placed under it. The springs so tested are taken from the racks at the factory, and not made especially to be exhibited.

Among other styles exhibited is the compensating side spring, which gives good satisfaction to the users. It is a long spring, which, instead of being hung in loose shackles is hung on what carriage makers call two "jacks," on the head works and axle bed. The ends are so formed that as the middle of the spring stretches the ends take up, or rather curve over, and do not push the ends of the wagon apart.

The "compound spring" exhibited was made by the Betts company to suit the special requirements of the Oppenheim buggy, to which it is particularly adapted. This is a "jump seat" buggy; that is, it can be made single or double-seated at will, by a peculiar construction that admits of the hind seat being folded over to the front when not needed, or thrown back so as to be utilized. This style of buggy requires peculiar springs to suit the varying load, as light springs, suitable for carrying two persons, would not be strong enough for four, and if made too heavy would be stiff. To overcome this the compound spring was devised. There is nothing particularly new in it except its adaptation to this class of vehicles. It consists of an ordinary spring, with a smaller sup-

## New Style of Elevator Hoist.

We saw this week at the machine shop of Hawkins & Cantrell, 210 Beale street, a new style of elevator hoist, comprising a new combination of mechanical principles. The hoist was invented by Mr. Hawkins, and a model of it has been placed in the fair, the machine itself, the first one of its kind, being needed immediately by the purchasers, so it could not be exhibited. The apparatus itself is very simple, the only wonder being, as in many other cases, that some one has not thought of the application before. In brief it consists in the employment of a screw shaft having a nut which is caused to travel from end to end by rotation of the shaft. This nut is connected by suitable ropes with drums or pulleys for multiplying the motion given by the screw and to connect with the elevator drum.

The machine just completed at the shop is intended for a wine cellar at Fresno. The elevator cage, guides, rope, pulleys, etc., are not essentially different from those employed in other hoists, and may be used equally well with this device. The screw shaft is horizontal, with journals turning in boxes at each end, the read end being fitted with suitable thrust bearings. The threads in the screw shaft are cut of a pitch sufficient to move a traveling cross-head or nut at the proper rate of speed. In this one the screw is ten feet long, three inches in diameter and one inch pitch, and is calculated to hoist about 3,000 pounds.

The traveling cross-head has a guide or guides, and the ropes from the drum are attached by bolts to the cross-head (which has a brass nutbushing) so that as the screw shaft is rotated the traveling cross-head is drawn outward, the drum and pulley rotated and the cage elevated; when the nut is moved inward the cage is lowered. The screw may be driven in any manner desirable, by belt connection or directly by small engines. A pair of very handsome engines for this purpose were made by Hawkins & Cantrell and may now be seen in the California machine shop where they are being fitted to an old style elevator to go in the new Stock Exchange building. The contract for this elevator was made before the new style was constructed.

The cylinder frame in this hoist is set against the main frame so that it is all solid. By the use of this device the load will stop anywhere without being held by the engine. It is absolutely noiseless, there not being a gear wheel in the machine, so that it is in this respect alone superior to elevator hoists generally. The usual arrangements for stopping and reversing can be used, but the stoppage or start is accomplished without any jar or suddenness, which is usually an objectionable feature in elevators.

Messrs. Hawkins & Cantrell exhibit in the fair one of these hoisting engines for mining purposes, a style in extensive use on this coast in prospecting mines. They are made with a solid iron frame and so arranged that an engine can be put at work in an hour after arriving on the ground. They are heavier and stronger than those of Eastern manufacture, it being necessary in mining work to have them of the strongest material. The smaller engines have vertical boilers with single engine and reel like that exhibited; and the larger double engines, capable of hoisting from a depth of 1,000 feet are made with locomotive boilers. This class of engines being much less expensive than heavy hoisting works are in demand for opening mines.

**PERMANENTLY CHAINED.**—Before leaving for the East as one of the Creedmoor team, Mr. Geo. H. Strong, of the firm of Dewey & Co., was the recipient of a modest-sized but richly ornamented watch chain, containing specimen gold and quartz settings, purchased from Col. Andrew's diamond palace by his partners. Other valuable and equally handsome tokens were also bestowed upon him by partners and employees of the office. Chained, as he has been, to the post of duty for 13 years, with scarcely an intermission, his partners and employees have been enchained to him by his courteous and ever-patient demeanor through long years of business connection. Now chained to them by these parting testimonials of esteem and good feeling, his early return will be earnestly desired and daily looked for. May victory crown him and his comrades, is the hearty wish of every true Californian.

**THE Braidwood, Illinois, miners** have made a proposition to resume work, but no action was taken by the mine owners.



VIEW OF LAKE TAHOE, BETWEEN GLENBROOK AND ROWLAND'S, LOOKING SOUTH AND WEST.

plemental spring fastened to its center above and below, so that with an increased load the supplemental spring takes its part of the load. In this way this extra spring is inoperative until the load is increased so as to bend the main spring down far enough to bring the extra spring into use. Mr. Betts proposes putting this style of spring on express wagons and that class of vehicles in which the weight of loads varies considerably. He calls it the Betts compound spring, and it takes the place of the heavy pieces of rubber usually employed, but which are too rigid and not as well adapted for the purpose as the supplemental spring.

Among other styles of springs made at these works are car springs for railroad cars; also, springs made in two elliptics of 38 leaves, for butcher wagons, etc., calculated to hold from four to six tons. The works of the company are at No. 218 Fremont street, in this city.

## Lake Tahoe.

The engraving on this page, giving a glimpse of the famous Lake Tahoe is copied from a superior engraving in H. F. Williams' standard work, "The Pacific Tourist." The engraving in Mr. Williams' book was made from the celebrated painting by Thomas Moran. We prepare the engraving to illustrate the very carefully written and interesting paper on Lake Tahoe, from the pen of Major J. W. A. Wright, which may be found on page 130 of this issue. This lake is one of California's gems, and, though there may be many who know of its beauties, there are hosts who have not gazed upon its waters, and to whom the description we give will come with gratifying freshness, and create a longing for a visit, which those are happy who have money and leisure to secure.



### The Combination Shaft.

One of the Great Mining Projects of the Day.

The Chollar-Norcross-Savage shaft, or, as it is more generally called, the Combination shaft, is now nearing the level of the Suro tunnel. So near each other have the workings of these two great mining projects come, says the *Gold Hill News*, that the blasts in the tunnel are distinctly heard by the workmen in the shaft. Nor is this very wonderful when it is considered that here remain only about 1,050 feet of rock between the two points, and that the charges used in the tunnel are very heavy, several in number and are all exploded at the same instant of time by electric exploders. The discharges of blasts in the Combination shaft are also distinctly heard in the east drift, 1800-foot level, of the Chollar-Potosi, the distance between the two points being about 900 feet. The tunnel line, it will be remembered, however, is 365 feet north of the shaft.

### A Great Mining Project.

Every day shows more conclusively the wisdom of going half a mile east the main line of the present hoisting works of the Comstock and of sinking a monster shaft perpendicularly to the ledge. Should the general dip of the Comstock be maintained to greater depths, this monster shaft will strike the vein about 2,500 feet from the surface. The same wisdom which conceived the project is being exemplified in carrying it on. Everything is on a scale commensurate with the undertaking itself. Before a spade or pick was struck to even grade off the locality of the present works, preparations for convenient access were made, and a side track from the Virginia and Truckee railroad and a wagon road to the site projected. Then commenced the grand preparations, the plans of which had all been fully matured by I. L. Regna, the chosen Superintendent of the shaft.

### The Site, Shaft, Works, Etc.

The site selected for the shaft was a most eligible one. From it the view of the city is particularly fine. It stands some 200 feet above the bottom of the ravine, and has dump room sufficient for years. The site having been determined upon, a double grade was made, the upper one of about three acres, for the hoisting works proper, and the lower one for the shaft, blacksmith and carpenter shops, etc. The shaft, which was started on the lower grade, is the largest and finest on the lode. The actual excavation is 10 feet 6 inches by 30 feet 6 inches. The shaft, when timbered by 14 by 14 timbers of spruce, has four compartments, three being 5 by 6 in the clear, and the fourth, or pump compartment, being 6 by 7 feet. Its depth is now about 1,550 feet. The main building is 60 by 140 feet, 20 feet high and contains the hoisting and pumping engines. The room is well lighted and easy of access, being on the upper grade, and reached by both wagon road and side track. It extends out over the shaft room and affords ample space for offices when needed at the works.

### The Shaft Room and Shops

Are situated on the lower grade. The former is 40 by 60 feet and 32 feet high, that being the difference in altitude of the two grades. The east side of the room is the wall extending from the lower to the upper grade. This wall is eight feet in thickness at the bottom, 32 feet high, and built of heavy granite. It contains four vertical piers, and is pierced for the shaft end of the pump hob. The carpenter shop is at the southwest corner of the shaft room, is 40 by 80 feet, 16 feet high, and fitted up with the usual facilities for preparing timbers, etc. The machine is run by a 35 horse-power engine.

The timbers, etc., are all dumped from the upper grade, right where wanted. The blacksmith shop is at the west end of the main structure, is 30 by 60 feet, and 20 feet high. It contains two forges driven by a blower. The drying room is south of the main building, and is 30 by 50 feet. The boiler room is north of the main building, is 40 by 50 feet, and 20 feet high, and contains two sets of largest-size boilers.

### The Machinery

Is first-class in every respect. The hoisting engine is geared to 350 horse-power, and is sufficient to do the required work after the lode is reached as well as before. It turns two reels, on each of which are wound 2,900 feet of cable six inches wide and five-eighths of an inch thick. Near the hoisting engine is a double-gear steam winch, or pump-hoist, capable of lifting 80 tons. It moves slowly and strongly, from 60 to 75 feet per minute being its most rapid movements. It has windlass heads on each end, and is used by means of a snatch block for moving heavy objects anywhere about the building. The cable attached is seven inches by five-eighths of an inch, and made by Hallidie & Co., San Francisco, of the best steel wires. It has the strength to handle the pumps to the depth of 3,500 feet.

### The Pumping Apparatus

Is second to none on the lode. It stands near the shaft and has never been used, there being very little water in the shaft. It is, however, all ready to run, and is a vertical compound condenser of 700-horse power, capable of running a double column of 12-inch, 8-foot plunger pumps to any required depth. It is controlled by the Davy differential valve, and can make one stroke in 15 minutes, or 12 strokes in one minute. It is attached directly to the hishop head of the bob. The initial cylinder is 32 inches by 10 feet stroke, the expansion cylinder is 64 inches

by 8 feet stroke. The engines, pumps and bob weigh 150 tons. The beam of the bob is all iron and weighs 52 tons. There are 10 sticks for pump rods on hand, each 15 by 15 and 100 feet long, Oregon pine, and cost here \$300 each. They are the finest sticks ever seen on the Comstock, being as straight as arrows and of the clear stuff. The joints at the ends of these as they go together to form the rod will be cut square and oak keys fitted and driven in so as to make all solid as the native stick. These joints will be still more firmly secured by iron straps 10 inches wide, one inch thick and 36 feet long, one on each side. These sticks are all numbered and bored, and the plates are also numbered and perforated to correspond. In the side of the shaft room panel doors have been placed, one above another, and above a section of the floor made movable for the purpose of handling these sticks for pump rods. The pumps are all on hand ready to be put in.

### The Sheaves, Skeet, Etc.

The sheaves and the construction of the gallow frame are unique and worthy of particular mention. The frame is built upon the top of the stone wall above mentioned. The sheaves are 18 feet in diameter, and so set as to carry the cable over to the center of the shaft below. The faces of the sheaves are eight and a half inches wide, filled with oak wood to prevent crystallization. They are so constructed as to stand the strain of 100 tons each. At the end of the cable, instead of a cage, is found a skeet, an excellent invention of Mr. Regna, capable of holding five tons of rock, and which dispenses with all station tenders, as by an ingenious contrivance it dumps and rights itself. It saves the handling of an immense amount of dead weight. It is still now most of the time, but brings up 100 tons of rock and 16,000 gallons of water daily, and there are required to run all the saws, machinery, etc., and do this work only 20 cords of wood per week. When the works are all completed and in running order, and three of these skeets used, 2,000 tons of rock can be raised per day.

### Miscellaneous Mention.

This shaft is situated 2,327 feet east of the Chollar-Potosi shaft. It was recently plumbed and found to be but one-quarter of an inch out of the way north and south, and one-half an inch east and west, which shows what kind of work Mr. Regna is doing. It is so smooth and straight that the skeets pass up and down without bearing against the guides. The general arrangement of the works is as perfect as any on the lode, and was all planned by Mr. Regna. In bringing the pump rods from San Francisco they were loaded on four flat cars, the weight, however, being borne principally by the end cars. In this manner all the twists and turns of the railroad were made in safety. The rope house is 200 feet east of the main building, so that in case of fire the works will not be endangered. The company own 35 acres of land where the works are situated, and every time the place is visited, the wisdom of the undertaking, and the excellence of the arrangements made by Mr. Regna to carry it out, are made more and more apparent.

### Nevada County Copper Interest.

Down in Rough and Ready township, on the range between Penn Valley and the Round Tent House, is a portion of an extensive copper belt which at the present time is exciting considerable interest among miners and capitalists, and is destined in the near future to receive still more attention. In 1862-3 there were very lively times in the vicinity of Spenceville, and the excitement there became intense on account of the discoveries made in that section. Thousands of claims were located and shafts were sunk on them in every direction. It is said that the whole district for ten miles in width and twenty miles in length was peopled with prospectors who were searching for copper lodes and talking copper. Shares in some of the claims sold for a hundred dollars per foot, and almost any kind of a claim was considered valuable. The ore in all the ledges contained a per cent. of copper that would pay to mine and reduce in Europe, and many of them were said to assay from three to thirty per cent. A shipment of ore from one of the claims to Swansea is said to have paid \$35 per ton above the expense of mining, shipping and reducing. The belt is said to be literally covered with lodes, almost all of which would pay for work if the ore could be reduced at a low cost. In 1863 that desideratum was not reached and the section was abandoned. Some years ago Mr. Deekin, an experienced mining expert and engineer, concluded to experiment upon the ore, and accordingly re-located what was known as the "Well Lode," at Spenceville. He expended considerable money and a good deal of time, but did not achieve satisfactory success. He was succeeded in the management of the property by Mr. C. Borger, a thoroughly scientific and experienced miner, who has, by repeated experiments and continued practical work, at last demonstrated, beyond a doubt, that copper mining can be successfully and profitably carried on in that section. The property is owned by an incorporated company known as the San Francisco Copper Mining Company. They own 3,000 feet of ground. The lode at the depth of 30 feet is at some places 125 feet wide. The ore averages, by working process, about six per cent copper. The balance is composed of iron, sulphur and zinc, in about the following proportions: 40 per cent iron, 45 per cent sulphur, 2 per cent silica, from 2 to 4 per cent zinc.

Mr. Borger has so perfected his method of working that \$51 can be realized as profit from every ton of ore raised and reduced. Last month the expenses of the company were \$2,500. They extracted 22 tons of copper, that sells from \$300 to \$320 per ton in market, which, as readily will be seen, affords a nice profit. To obtain this result there were only 25 tons of ore reduced per day. The works will be enlarged inside of 60 days, so that 40 tons per day can be worked. All that is necessary in order to obtain any given amount of money per day from these claims is to figure how many tons of ore it will require and then extend the works so as to reduce that number. The ore body is practically inexhaustible and will increase in value as it is sunk upon without a doubt. The Superintendent informs us that the ore in his ledge is the lowest grade of any in the district, but it has the advantage of being the largest, and as it can be worked at a nice profit, is perhaps the most valuable. The process by which the ore is now successfully worked by Mr. Borger is not claimed to be a secret, but only a successful one for reducing this class of ores. It is rude, but cheap and effective, and to Mr. Borger the county is indebted for guaranteeing the certain development, in the near future, of one of the most important interests within its boundaries. The ore is raised by means of steam hoisting works from a perpendicular shaft to a tramway about 20 feet above ground.

From there it is pushed in cars to the ore or roasting house—a large building, we should think, 250 feet in length and in the neighborhood of 40 feet in width, the sides of which are not inclosed. Here the ore is dumped into heaps of about 30 feet in length, 10 or 15 feet in width and six or eight feet high. There are two rows of these in the building. In the center of the heap is a brick flue. Brush and wood is placed under the ore and set on fire. In ignites the sulphur contained in the mass, which burns until the heap is thoroughly roasted. It takes about four months for a heap to burn out. From the roasting heaps the ore is taken to a vat house on the side hill above, where it is dumped into a series of vats and submerged in water which is heated to a boiling temperature by means of steam. The liquor from these vats is conducted automatically from point to point till it reaches large revolving tubs, in which are placed scraps of old iron which precipitate the copper. The pulp is then taken out and put into drying pans, when the work of reduction is complete. It is proper to state that the heated water does not extract but little above half the copper; while in the vats, so it becomes necessary to dump the residue into a pile and still further leech it. From this dump-pile a continual stream of liquor runs which is strongly impregnated with copper, and which is conducted into the revolving tanks by the same means as the liquor from the vats. From this source a continual source of revenue is obtained whether the other part of the works is running or not. In other words, a new mine is being formed all the time which will yield a steady profit at no cost whatever. The ore is mined and raised to the surface on a contract for \$1.10 per ton, and the contractors furnish all their own supplies. When these facts are taken into account it will readily be seen that copper mining in Nevada county is destined at no distant day to become one of its most important interests. The field is extensive, and the success of mining there is beyond question since Mr. Borger has discovered a way to work the ore successfully. His method, as said before, is no secret, and he promises to explain it fully to any who desire to engage in working lodes in that district. The works can be erected at a very small cost compared to the expense of erecting works for operating a quartz mine, with the additional advantages of a certainty of a liberal profit and a lasting permanency. It will not be a great while before that section will be the liveliest and most prosperous part of the county. —*Nevada Gazette*.

### A New Mexican Process.

We condense the following from an article in the *Federalista*, a Mexican journal, translated by Mr. A. Leon Cervantes for the *San Luis Obispo Tribune*, on a new process for reducing metals:

Three years ago, Senor Ignacio S. Portugal came from the interior (State of Jalisco) to demand a privilege for a system of reducing metals, invented by himself. Said system obtained the approval of several of our most distinguished metallurgists, to whom Senor Portugal explained his system. It was then seen that the principles on which said system was based were perfectly adjusted to the data of science; the only thing wanting was to search in practice the confirmation of the theory, that is to say: to prove that the imagined apparatus corresponded to the proposed object. The press then occupied itself several times in this important business, and also published satisfactory reports of competent persons in the matter.

Having obtained the respective privileges, Senor P. proceeded to assay his system; but, as frequently occurs, he met with unexpected difficulties, by which he comprehended that the hard task of his scientific observations had not ended. Nevertheless, instead of dismaying at such obstacles, he attacked them with indomitable energy, succeeding finally, after two years of unremitting studies and experiments, in seeing his efforts crowned, and the problem which has been the thought of all his life, resolved. The following report by persons, whose scientific authority no one doubts, is the best support that

can be conferred on the new system, which, already perfected by its author, is destined, as we have said before, to exert an incalculable influence for the good of our country. Indeed, by Senor P.'s method, ores whose reduction can not be profitable by the methods now in use can be treated profitably. As the action of the fire is limited to heating only and not to smelting, it follows naturally a considerable economy in combustibles. The rapidity with which the reduction is made, the nature of the substances employed to make it, the instantaneous amalgamation, the loss of no precious metal, the utility of all component metals, and many other incalculable advantages of this system demonstrate very clearly the great economy in time and money that can be introduced in the mineral industry, and, of course, the vast development of which this industry is susceptible.

### Report.

"Invited by the Citizen Ignacio S. Portugal to examine his system of reduction of argentiferous ores, we visited his laboratory and were much pleased to see the results he obtained."

"The said system consists, 1st. In the transformation of the sulphurets into oxides and in the reduction of the latter to metals. 2d. In the amalgamation of the metals reduced. 3d. In the separation of the same.

"The first operation is effected in a furnace invented by Senor P., of which we examined a well detailed model. In this furnace the transformation and reduction of the ores can be made very rapidly and at a temperature very inferior to the one that would be necessary to smelt them. To this circumstance, which implies a great saving of combustible in comparison to the ordinary smelting system, we ought to add that the condition of the furnace permits that the reduced minerals, in cooling, cede their heat to those entering afterwards into the furnace. Some of the advantages that we find in this system of reduction consist in the facility with which the sulphur of the sulphurets can be bad; and there being no fusion of the mineral, there is no loss of precious metals, as it happens in the ordinary reduction by fire."

Senor Portugal submitted to our examination some portions of mineral ready prepared by his system, and we saw with satisfaction that the reduction had been perfect, as we had only to wash the earths with a little water to separate the various metals which formed the bases of the compounds previously existing in the mineral. The amalgamation of the ores so reduced is instantaneous and complete; the mercury gathers with the greatest facility all those metals capable of amalgamation. We examined afterwards the mass of metals and the remaining dust. In the former we could recognize gold, silver, lead, copper, zinc and antimony, and in the latter we could not find any vestiges of precious metals.

Senor P. showed to us various methods by which he could separate easily and economically all the compounds of the amalgam. It is here where we saw the most notable advantages of this system, as not only the precious metals can be obtained, but also those we mentioned before, which are lost in the other systems. Senor P. separates the iron which is not capable of a direct amalgamation by a physical operation easily executed.

These are briefly the experiments that we saw in practice which demonstrated to us that the author of this system, with an unexampled fixedness of purpose and self-abnegation, has worked for a long time to perfect the metallurgical method which he tried to plant some time ago. The chemical theory of the new system is rational and the experiments in accordance with its indications. Senor P. has made a laborious calculation to demonstrate the economy in time and money found in his system above all others.

(Signed)

GUMERINDO MENDOZA,

Professor of Chemistry.

(Signed)

MARIANO BARCENA,

(Signed)

Assayer and Separator of Metals, titled.

(Signed)

FRANCISCO KASKA,

Professor of Chemistry.

(Signed)

JOSE M. CESAR.

City of Mexico, March 8th, 1877.

A FOLDING BOAT.—A few days ago a new and ingeniously constructed portable boat was launched and tested on the Clyde. The boat, which is eight feet in length, and two feet eight inches in breadth, is composed of hickory wood and constructed in such a way as permits of its being folded up till it assumes the appearance of a somewhat large traveling case. When packed it contains the oars, seats, canvas covering, with sufficient space left for other necessities, and as the whole weighs but little over 56 pounds, it can be easily carried about from place to place. Before being put in the water, the frame of the boat is drawn out to its full length, and covered on the bottom and sides with a strong water-proof canvas covering. The process of unpacking and fitting the boat with its covering ready for the water occupied only the space of three minutes.

WORKING THE FLUE DUST.—Everything is moving along very smoothly at the Lemmon mill. The lessees were very much annoyed when first starting up by the constant breaking down of parts of the machinery that had become impaired and rusted by long disuse. This not only necessitated frequent stoppages, but also a largely increased money outlay. Messrs. Clark & Wallace's indomitable perseverance has triumphantly overcome all these obstacles and the process is an assured success, and is another element in Eureka's continued prosperity. —*Eureka Sentinel*.



## Pavilion Garden.

## Fruits, Flowers and Rustic Work.

We are pleased to observe that continual additions are being made to the fruit and flower departments of our highly praiseworthy and good-effecting Mechanics' exhibition. R. B. Woodward displays in a glass case four interesting specimens of the insectivorous *nerpethes* or Pitcher plant, viz: *Darlingtonia Californica*, *N. Saraceniana*, *N. distillatoria*, and *N. ampullacea*. About twenty species of these remarkable and attractive plants are known, by far the greater part of which are natives of Borneo, Sumatra, and the adjacent islands of the Indian Archipelago. The oddity of the foliaceous organs in this genus, with their curious terminal, pitcher-like appendages has attracted great attention among botanists. The size and shape of the pitchers vary much in the different kinds. One sort has the blade of the leaf eighteen inches long by seven or eight broad, and the pitcher twelve inches long by six in diameter, of a broad ampulla form, with two fringed wings in front.

The two tables of cut flowers, one from Miller, Sievers & Co's exotic garden, near Woodward's Gardens, and the other from Thos. Saywell's conservatory, Lombard street, embellish and enliven the horticultural department greatly, with the beautiful and gorgeous blooms of gladioluses, dahlias, fuchsias, roses, etc., and other rare and lovely plants of many varieties on several stands. And what infinite profusion, and what marvelous variety of forms and colors, habit, flowers, leaves! What human imagination, so fertile, so capricious, as it may be supposed, would have dreamed these thousand shapes of leaves, these continual contrasts of aspect and shades of color, the inimitable elegance or the nameless oddity, prodigies of Nature, which science shows to us, are subjected, even in their most fantastic variation, to simple and immutable laws.

On the entrance platform is shown a very extensive collection of handsome and very ingenious rustic work, by T. Duffy, corner O'Farrell and Leavenworth streets. Here are beautiful jardinières of all sizes, shapes and prices. Tables, chairs, sofas, lounges; hanging corner and side baskets, and every variety of rustic and root works; vases, fountains, whatnots, and all other styles of this free and elegant mode of working up the natural wood of many colors, graining and variety of shapes. All this rustic work is mounted on castors; can be moved with ease, and are water tight, and can be watered in the hall entrance or parlor without soiling anything. Conservatories, gardens, summer houses, and hay windows can be thus furnished with all these and many other kinds of ornamental rustic works, and fern cases of any size. Especially is it appropriate for a real rustic house or cottage to have rustic ornaments, even at the threshold; but this ornamentation is appropriate, in some parts of every villa residence.

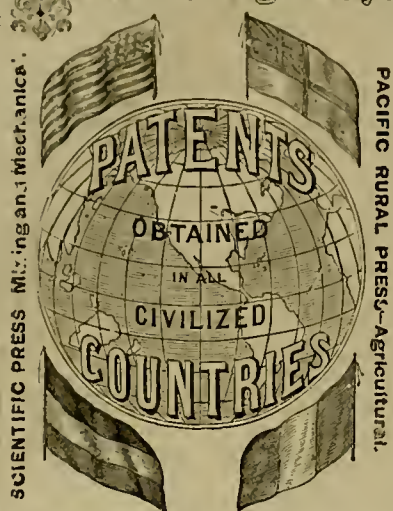
From Garey's semi-tropical nurseries both fruit and trees of the famous Garey's Mediterranean sweet-orange are shown at the stand of R. J. Trumbull, sculpsman and florist, Sansome street. Some of this fruit is preserved in bottles of alcohol, and is very fine and large. Here also may be seen several sorts of the highly valued and lately introduced fruit of the Japanese persimmon (*Diospyros Kaki*).

The *Journal of Commerce* makes a most extensive and miscellaneous display of the productions of the whole Pacific coast, but especially of California. Here is an example of the vast possibilities of this coast and State, and the belief will suggest itself to the visitor that all the wonders of our prolific land have not by a great deal been yet revealed. Most of the specimens of fruits and vegetables are very large and handsome—the fruits especially are very beautifully colored. Some mountain peaches from Mr. Perry, near Murphy's, Calaveras county, struck us very forcibly, from their great size, brilliant coloring and remarkable juiciness, exceeding in this respect our Sacramento peaches, although we cannot say that their flavor to our palate, was much better than the lowland fruit of that kind. There were four kinds of them, two being George the Fourth and Honest John. Their delightful aroma attracted particularly our notice. Dr. Stivers was again on hand with his specimens of the many beautiful woods of the whole Pacific slope.—E. J. Hooper in *Fair Daily*.

**DEMOLISHED.**—The work of demolishing the old Jackson furnaces is proceeding rapidly, one of them having been already taken down, and the other will probably be raised to the foundations this evening. The intersects of the stones comprising the furnaces are filled with lead, and every open space in the walls permeated with the bullion. On the rocks taken from the furnace, depositions of pure arsenic are also found in considerable quantities. There is no doubt but that the company will be rewarded with a large amount of base bullion, as the quantity in sight is very large, and when the foundations are reached, a deposit that has leaked through the bottom of the furnace will be met with. In the first attempts at smelting in Eureka, patent bottoms were unknown, and a large quantity of the base and precious metals were lost through the imperfect construction of the furnaces. The Jackson company contem-

plate the erection of a first-class furnace in every particular, but it is probable that they will abandon the old site, the dump room for slag being insufficient. It is the intention of the company, providing they can secure control of the proper amount of water needed, to build on Ruby Hill, in close proximity to the mine. Much of the material in the old furnace can be utilized in building the new one, and it is calculated that the cost of transporting ores from the mine to the furnace will be saved, making quite a difference in the economical reduction of the ores. The Jackson will soon be adding its quota to the bullion product of the district.—*Eureka Sentinel*.

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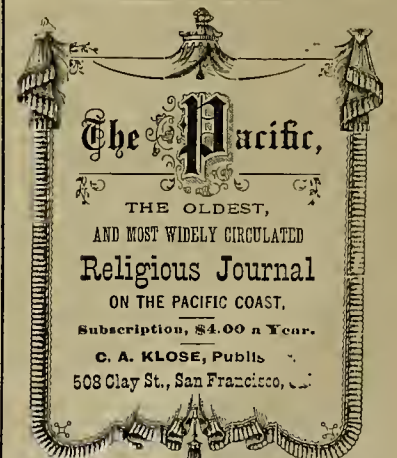
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**APPRECIATION ABROAD.**—We copy the following from the *Mining and Monetary Gazette*, of London, England: "We deemed it advisable, as affording valuable information to our readers, to publish in recent issues of *The Gazette*, the full text of the 'United States Mining Laws and Instructions, by the Commissioner of General Land Office, taken from our talented contemporary, *The MINING AND SCIENTIFIC PRESS*, of San Francisco. The documents have now been issued in a handsomely bound volume by Messrs. Dewey & Co., the publishers of our transatlantic contemporary, and it will be found very useful to those already interested in American mines, and to others who may be tempted to embark in that enterprise in the States."



Continued from page 133

from the mine, there can be no legitimate excuse for delay in paying the employees for their services; and as it has been fully demonstrated that they will not work without prompt payment, we trust that the company will see to it that when the 10th of the month comes round, the money will be forthcoming. The prospects of the mine are all that could be desired, and we are informed that no effort will be spared to make it yield handsome returns to its owners.

**AUTRAIS COUNTY MINES.**—*Cor. Idaho World*, Aug. 24: Under the management and supervision of Superintendents Pettitt, Lantis and Algehr, of the Monarch and Buffalo companies, operating on the famous Atlanta lode, the opening up of these rich and extensive mines will eventually yield a handsome revenue to the companies. The Buffalo company have started up their mill dry-crushing, their furnace being complete. Will commence operating on next Monday. Every one feels jubilant over the prospect of the furnace working successfully. The company working on the John Simmons ground, west of the Buffalo, is a wealthy Pennsylvania oil company. Capt. Bledsoe is their Superintendent, and is down with the working shaft 50 feet, and found some ruby silver ores that are rich, together with smelting ores that will go \$200 per ton. This company will sink 300 feet, cross-cutting the ledge every 50 feet. Here at Rocky Bar mines are assuming a lively appearance, owing to the many heavy-laden freight teams arriving daily with goods and machinery for Atlanta. The Rollins company, working on the Confederate and Golden Star mines, have about 20 hands employed, and are doing well considering the many obstacles.

## Montana.

**ANOTHER ARASTRA.**—*Butte Miner*, Aug. 18: We learn from one of the proprietors that the new arastra of Supernant & Mercant, on the Little Deer Lodge, about seven miles from town, commenced work for the first time on Monday, the 6th inst., and has since been running in tip-top style. This arastra is driven by a 20-foot overshot wheel, has two beds, each 12 feet in diameter, and one pan and settler. As high as five tons of ore have been worked with it in one day, but this was of ore softer than the average. It is thought that four tons per day will be about its every-day work, and at that figure it will about equal a five-stamp mill. It will be employed altogether in custom work, and is now at work on some ore from the Twin Stevens lode, while there is also some from the La Plata on hand waiting its turn.

## Oregon.

**CINNABAR.**—*Oregon Sentinel*, Aug. 22: "A party, composed of Henry Kippel, T. B. Kent, John S. Miller and G. W. Holt, will start for the cinabar district this morning. Mr. Holt goes out to do the brick work, preparatory to setting up the retort, and everything will be in running order by next Saturday. The company has about 10 tons of ore out, which is expected will yield about five tons of quicksilver. A force of men will be steadily employed in getting out ore as soon as the retort is in working order.

## Utah.

**BEAVER DISTRICT.**—*Cor. Salt Lake Tribune*, Aug. 24: The town of Shantite is almost deserted, although the mines are not. Most of the Shantites have gone to Lake Panguitch, the Yosemite of Southern Utah. It is estimated that there are 150 persons now sojourning at the lake, distant 60 miles southeast from Beaver, and a most enjoyable place during the heated term. The mines are looking well and improving. The Millford furnace has shut down, and no doubt will remain so until lead advances.

**FRISCO.**—The new Godbe & Co. smelter is completed and is ready to start. It is complete in all its arrangements, and reflects credit upon its builders. The machinery is of the best and latest pattern. Large piles of calcined ore lie on the dump, awaiting reduction. The Horn silver mine still increases in size and richness.

## Affairs at Eureka.

The decision in the Eureka Con. vs. Richmond case, which we gave last week, has had the effect of causing a revival of mining affairs in Eureka, as was expected. The two idle furnaces of the Eureka Consolidated have been put in shape for work, and more men will be employed. A large number of these men, who have been idle for some time, have been in the town for the past six months. The *Sentinel* says their number has been augmented by fresh arrivals from outlying districts, and there are at the present time at least 1,000 idle men in the town, awaiting the resumption of operations at the mines and furnaces. About one-half of these will be added to the pay rolls within the next month, and will make an aggregate of about 1,000 miners and furnace men employed in the district. This will turn loose in the neighborhood of \$120,000 monthly, which amount, added to the coin circulation, will infuse new life into the arteries of trade and business.

Both of these large companies have been of great benefit to the camp, and it made little difference to whom the land belonged so long as it was worked and gave miners employment. The Richmond is still a good mine, notwithstanding the loss of the Potts chamber, and there is plenty of ore yet to be worked, so that the mine will no doubt soon be in full blast again. The Eureka Consolidated now being free to take ore from the ground formerly in dispute, will work the 9th and 10th levels energetically. While prospecting during the continuance of the injunction they found a rich body of ore on the 10th level, and which now belongs to them. It is estimated that they will extract 1,500 tons per week, with plenty in sight.

The suit determined the ownership of the disputed ground, but the Eureka Consolidated company will, it is said, sue for \$2,500,000, the value of the ore claimed to have been taken from the Potts chamber. This suit will probably be tried by jury. The Richmond company will appeal the case to the Supreme Court, but the appeal will not stop operations at the Eureka Consolidated mine, as they will furnish bonds for any damage likely to accrue.

The Ophir mining company to-day entered suit against Mrs. Cooper for the sum of \$2,800 damages, for the unlawful appropriation to her own use of lumber and paint belonging to the Ophir mining company.

## Miners' Union and Mining Companies.

We recently stated that the Miners' Union, of Virginia City, had issued an order that no one not belonging to the Order should be permitted to work in the mines underground, after September 10th. It was apprehended that this order would lead to trouble and disorder. The miners and superintendents, however, have held two joint meetings to discuss the proposition, and it was agreed that none but Union men should be employed in the mines; and when a man is hurt while at work, the company will not be called upon to defray any expenses for physicians or hospital treatment. The *Virginia Chronicle*, of Monday, gives the following account of the meeting:

At three o'clock yesterday afternoon an important meeting was held in Miners' Union Hall, composed of the committees from the Miners' Unions of Virginia, Gold Hill, and Silver City on the one hand, and of the principal Comstock mine Superintendents on the other. Among the latter were Colonel James G. Fair, of the Consolidated Virginia and California; William Hardy, of the Ophir, F. E. Osbiston, of the Gould & Curry and Best and Belcher; Colonel M. G. Gillette, of the Savage; Philip Deidesheimer, of the Hale & Norcross; Frank Thayer, of the Julia; Isaac L. Requea, of the Chollar and Combination shaft; E. A. Shultz, of the Bullion, Exchequer and Justice; W. H. Smith, of the Belcher; Captain Matt Canavan, of the New York; W. B. Sheppard, of the Utah; Charles Bonnemont, of the South Nevada; Jasper Babcock, of the Leviathan, and some others whose names we did not ascertain. The meeting was held in secret, none being admitted except members of the Miners' Committees and the Superintendents, and since the meeting it has been very difficult to obtain any information. We are informed, however, that the meeting was held at the request of the Superintendents, who wished to take such steps as might be feasible to prevent any trouble arising out of the order recently published by the Miners' Unions, namely, that, after the 10th of September next, no person not a member of the Union, would be allowed to work as a miner under ground, except foremen or Superintendents. There was a lengthy discussion on the matter, in which good feeling and a desire to effect a fair and amicable settlement were shown on both sides. Finally, the desired object was accomplished by an agreement on the part of the Superintendents that, after the 10th inst., they would discharge from the mines any miner reported to them as not being a member and refusing to become one. It is a source of gratification to everybody that this matter has been amicably settled, and it was a wise course to take time by the forelock and bring about this meeting whereby a concert of action is secured. Otherwise, by the action of some single hot-headed Superintendent, or by imprudent conduct on the part of individual miners, a condition of ill feeling might have been brought about which would have resulted in no good to any one.

## Aaron's Process in Mono County.

**EDITORS PRESS:**—In reference to the article on "Mono county mines," in your issue of the 18th instant, I wish to state that the editor of the *Inyo Independent* formed his conclusions somewhat too hastily from remarks of my own. The failure of the Aaron process to work the ores of the Diana mine, for the past year or two, was owing to the want of knowledge of the operator. I am now working ores of \$431 per ton, and the tailings average \$18 only, and might easily be made poorer. The bullion is from .960 to .990 fine, from ore carrying 30 or 40 per cent. of copper, with some lead and considerable antimony. The only troubles arise from the very depressed state of the company's finances, caused by the fact that some \$20,000, which should be in the treasury, is in a pile of tailings, where, though not irretrievably lost, it is not immediately available in the purchase of the material and machinery required.

I have not enough barrels to amalgamate the rich ore as fast as the stamps can crush it; quicksilver is scarce, and the separator is so poor a machine that I have not been able to make it work satisfactorily. C. H. AARON.  
Benton, Mono County, Aug. 22d, 1877.

**BULLION SHIPMENTS.**—Since our last issue shipments of bullion from prominent mines have been as follows: Grand Prize, Aug. 23d, \$11,500; Northern Belle, 21st, \$6,405.67; Endowment, 24th, \$2,699.18; Gen. Thomas, 21st, \$460; Tybo Con., 21st, \$3,827.41; Northern Belle, 23d, \$8,301.65; California, 25th, \$205,415.96; total to date, \$768,969.80; Con. Virginia, 25th, \$234,191.77; total to date, \$696,761.71; Tybo Con., 23d, \$8,331, total to date, \$33,235; Martin White, 22d, \$8,470.04; Standard, 26th, \$29,917.58; Arizona, 26th, \$2,393; Endowment, 29th, \$3,020; Grand Prize, 27th, \$18,000; Leopard, 27th, \$6,800; Tybo Con., 25th, \$4,230.80; Northern Belle, 26th, \$10,590; Con. Virginia, 29th, \$157,912.84; California, 29th, \$156,953.44; total, \$314,866.33. The total for the month is: Con. Virginia, \$354,674; California, \$925,923.

## Mining Decisions.

The Supreme Court of the State of Nevada, in the case of the Golden Fleece G. and S. M. Co. vs. the Cable Consolidated G. and S. M. Co., the decision on which is published in the *Enterprise*, held that a proper construction of the Act of Congress confines the location to a portion of the ledge covered by the surface boundaries, so that if the ledge should be found to cross the surface, the locator will be limited to the number of feet actually within the location; that is, if, in a claim 600 feet wide and 1,500 feet long, the ledge should cross the claim at right angles, the claimant will take only 600 feet, instead of 1,500 feet. This view of the law necessitates the locator desiring to acquire a right to 1,500 feet, to ascertain, before making a location, the exact direction of the ledge, and to have his surface boundaries include the ledge for the whole number of feet; otherwise the amount of ground not included will be lost to him.

Judge Cole, of the Sixth District Court of Nevada, has made a ruling of considerable importance, which we find in the *Eureka Sentinel*, as follows: In the case of the Emmet Consolidated mining company against Delay et al., in the District Court, this morning, the attorney for plaintiff appeared and moved to transfer the case to the United States Circuit Court under the statute. The Court immediately, of its own motion, instructed the clerk to enter an order dissolving the injunction against defendants. The Court said that hereafter no party would be allowed to make a stepping-stone of the District Court to obtain a provisional remedy and then transfer the case to the United States Courts, and thereby continue the operation of the remedy, perhaps to the prejudice of the other party. The order of the Court took the attorney greatly by surprise. The Court, however, stated that at the time of the transfer of the Eureka Consolidated against the Richmond, he had made up his mind and announced his intention to pursue such course in the future, and declined to reconsider the order in the present case.

## Edge Tools.

Among the many meritorious collections of home manufactured articles in the pavilion, none deserve a more careful inspection, more decided expression of praise, than that of edge tools, by W. F. Palmer. The making and tempering of edge tools for our mechanics is one of the most necessary, and at the same time most difficult manufactures we have. A good shaped tool, well tempered, is half the battle in a hard day's work, and California mechanics are noted for the generosity with which they will part with money where the object to be attained is an improved article used in their everyday labor.

We have read a great deal about the temper of the blades of swords, battle-axes and lances of "ye olden time," bow they used to cut down through iron headpiece, corset and mail armor, how they would bend double without breaking, but such steel, or such iron, or such tempering has never come within our immediate observation. Mr. Palmer comes as near to it as is necessary for practical use, as most of our carvers and hewers now take good care not to hack and slash at iron pots and plates of boiler iron with anything keener than a cold chisel. His tools are all finished and tempered with his own hand, as he is not yet possessed of the capital to run a large business, and this is the best guarantee of their excellence. Nearly all our ship carpenters, caulkers and other mechanics along the wharves now get their tools made by him, and he never loses a customer who has once given him a trial. His collection on exhibition embraces broad-axes, chisels, drawing-knives, adzes, chopping axes and hatchets, and all such tools generally, and are polished up like mirrors. Give him a call, country mechanics, and thus extend his area of usefulness. His workshop is on Berry street, between Fourth and Fifth.

THE Fish Commissioners have caused the arrest of eight violators of the law which forbids the taking of salmon from our rivers at this season of the year. Detectives have been sent to investigate the Sacramento river canneries, as complaints have been made that the conductors take out the young fish along with the mature. The Sacramento and San Joaquin rivers are now abundantly stocked with salmon, and if the laws are properly observed the supply will never fail. The shad have done as well as the salmon, and in a few years the bay and streams will be amply stocked with fish of this kind. The Commissioners successfully transported from the East about 106,000 young shad this season and placed them in the Sacramento river. During the season about 1,000 shad, weighing from three to five pounds each, have been accidentally taken out in the nets of fishermen.

THE London *Financier* says: According to private advices from Lyons, several failures have occurred in the silk trade, including one for \$1,000,000.

## PATENTS AND INVENTIONS.

### A Weekly List of U. S. Patents Issued to Pacific Coast Inventors.

[FROM OFFICIAL REPORTS FOR THE MINING AND SCIENTIFIC PRESS, DEWEY & CO., PUBLISHERS AND U. S. AND FOREIGN PATENT AGENTS.]

By Special Dispatch, Dated Washington, D. C., August 7th, 1877.

FOR WEEK ENDING AUGUST 14TH, 1877.

TICKET ENVELOPES.—James H. Culver, S. F.  
TOILET MIRRORS.—James G. Divoll, Sonora, Cal.  
CUT-OFF SLIDE FOR CUBE SUGAR MACHINES.—Luder Hopken, S. F.  
DRAFT TIPS FOR VEHICLES.—Arthur Marshall, S. F.  
WHIFFLETREES.—Albert Hayes, Petaluma, Cal.  
ROTARY WATER METERS.—John Simons and George Wallace, S. F.  
MACHINERY FOR CUTTING AND PRESSING SUGAR INTO CUBES.—William Jasper, S. F.  
TRADEMARK.  
SHOES.—Maynard & Jones, S. F.

### Notices of Recent Patents.

Among the patents recently obtained through Dewey & Co.'s SCIENTIFIC PRESS American and Foreign Patent Agency, the following are worthy of mention:

**CUT-OFF SLIDE FOR CUBE SUGAR MACHINES.**—Luder Hopken, S. F. The object of this invention is to provide an improved cut-off slide to be used in machines for making cube sugar; and it consists in the employment of an inclined or wedge-shaped slide, gradually thickening from front to back, and having similar shaped sides. The plate, or slide, cuts off from the sugar in the hopper, or receiver, the amount necessary to fill the molds without pushing out a quantity or packing it solidly. This device may be employed upon any machine in which a cut-off slide may be needed, and the inclines will serve as a compressing device to compact the sugar into the molds without other stamps.

**TOILET MIRROR.**—Jas. G. Divoll, Sonora, Tuolumne county. This is a novel method of combining one or more adjustable mirrors with a stationary mirror for toilet purposes. A strong rod projects from above a stationary mirror to a distance in front of it. To the outer end of the rod is a cup or other device to support the adjustable mirrors. Each mirror is suspended from one end of a curved rod, the opposite end of which is supported by the cup, so as to be swung in a circle. This arrangement of the mirrors is especially adapted for toilet purposes, as, by shifting the adjustable mirrors, a person standing in front of the fixed mirror can see every part of the head.

**TICKET ENVELOPE.**—Jas. H. Culver, S. F. This invention relates to a ticket or card envelope, which is so constructed that one entire side forms a flap or leaf, while the opposite side forms an open-faced ticket or card holder, so that the flap or leaf can be opened to expose the face of a ticket or card to be inspected or exhibited without removing it from the envelope or disturbing its position. The arrangement adopted forms a cheap and simple ticket envelope which will be very convenient, as the holder of the ticket need never remove it from the envelope. He can exhibit it to a doorkeeper by simply raising a flap or leaf so as to expose the face of the card, thus preserving the ticket in a clean or neat condition.

**INDIANS IN THE BLACK HILLS.**—A dispatch from Deadwood, dated the 25th, says: The party of twenty persons who left here about two weeks ago for Little Missouri river returned to-day. They report that on last Tuesday afternoon they discovered Indians close to them. They selected high ground and dug rifle pits. They had been digging about twenty minutes when nearly 500 Indians appeared on a bluff opposite, about 400 yards off, and commenced firing at them. The fight lasted nearly four hours. Thomas H. Carr, quartz recorder of Deadwood mining district, was shot through the head and killed. After dark the Indians withdrew and the miners escaped, being obliged to walk 150 miles to reach this city.

**A MINING PHENOMENON.**—James McCann informs us, says the Reese River *Reveille*, that the sulphuret ore in the Patriot mine, at a depth of 450 feet, has given away to chloride. This is something very unusual in ledges in this section, for chloride to come in at so great a depth, and is the first instance of the kind of which we have any knowledge. The ledges of this district, and those immediately adjacent, carry chloride ore at and near the surface, which gives out and is replaced by sulphurets at the depth where water is encountered. The chloride from the Patriot is brown in color and looks to be rich.

J. E. P. WEEKS, for over 20 years news editor of the Sacramento *Union*, died at Sacramento on Tuesday.

THE California team went East on Thursday morning to compete in the rifle-shooting match at Creedmoor.



## California Products at the Fair.

On entering the pavilion one may almost immediately see at their right the fine display of California and Pacific Coast products made by the *Journal of Commerce*. It is all of California production, we believe, except some fine woods and some few other articles. It is a stand 30 x 15 feet, pyramidal in form, having ranged upon it numberless bottles of wheat, oats and barley, samples of broom corn, ears of corn, specimens of the fiber of flax, ramie and hemp, tobacco of the finest leaf, bolls of cotton, manzanita wood of mammoth size, a section of fir tree, cactus wood and paper, and a tree of it 15 feet high, cocoa nuts, and coriander made from it, Tahitian bread fruit, wild oats from Souma nine feet high, a broom eleven feet long, and many other such articles.

In the vegetable line are mammoth beets, cabbages, potatoes, carrots, melons and squashes of forty pounds weight, go far toward convincing eastern visitors that all is not lying that is said of the wonderful growth of our vegetables.

The display of fruit is unequalled by anything ever before shown in our State or elsewhere. E. Runyon, of Sacramento, sends the finest and largest of peaches; Malaga, Muscat, Tokay and Malvoisio grapes of beauty and size incomparable from R. B. Blowers, of Woodland; Alexander apples of near two pound's weight from Briggs orchard, Marysville; figs, peanuts, walnuts, etc., from D. Conrad and others. Of dried fruit, fine fruit dried by the Aldeu and Walter processes of all kinds are there in abundance.

Twelve different kinds of tropical and semi-tropical fruits grown in California, Mexico, Central America and the Islands are shown, the most notable of which are the Shaddock, a species of large orange. B. F. Wellington shows 30 different kinds of seeds.

Of minerals, we have here shown iron, antimony, salt, sulphur, 40 gold and silver bricks, and also white and colored marble, etc., and a glass show case full of candy from Ebernfors & Rothschild's factory.

In the line of animal products we are first attracted by the wool exhibits, which have been prepared with great care, possess a fine silky fiber, and are a credit to the State producing them. Falkner, Bell & Co. submit a couple of show cases filled with samples from different sections, principally the northern portion of the State and Oregon. Henry P. Flint shows some beautiful samples, while B. P. Flint has on exhibition a splendid fleece. E. P. Bailey, of San Jose, contributes some magnificent goat skin robes, one of a delicate creamy white, the other of a cherry color. A case filled with cocoons of California silk, presented by R. B. Prince, shows that our claims in the matter of silk production are not altogether mythical. A pyramid of salmon from the cannery of Emerson, Corville & Co., on the Sacramento river, shows that our State may boast this delicious fish as well as Oregon.

The display of cactus and its product, paper, is quite lavish, and novel to many, as there are some who had no idea that cactus ever grew to such proportions as the log of wood shown would indicate. Withal it is a fine showing for so hastily prepared a collection.

## Hanging Material.

If the California Cordage Company had the exclusive right to hang every scoundrel in the United States, they could supply the rope to do it with out of their exhibit in the pavilion. In fact we have no serious reason to doubt but that the majority of them might be strung on the one great oil-boasting cable they have in the fair. What a wonderful improvement there has been in this one industry on this coast, in the last ten years or more. Any one who has never seen the present use of machinery in the "rope-walk," ought to solicit the privilege of going through the factory. Their display consists of three-inch hawsers of tarred rope, double twisted bawlers, hard and firm, for use in oil wells, hale rope, clothes line, and all the common sizes and kinds of rope for the various uses of agriculture, mining and mechanics. They have also a large, long tress of the raw material as a center piece, that might do duty at a masquerade as the flaxen tresses of a Saxon giantess. The capacity of the factory is about five million pounds and sufficient to more than supply the demand for the whole Pacific coast trade. It is located at the Potrero, near the Southern Pacific depot, and employs about 100 hands. The office and salesroom is at No. 611 and 613 Front street, where they have a large two-story building stored with the product of the factory, and by telegraph to the latter can fill any special order at twenty-four hours notice.

Messrs. Tubbs & Co. are making rope from two different materials, according to orders and the uses required. Sisal hemp or Maguery plant, and Manila. Of course they can make from any required material to suit purchasers. Patronize your home manufacture, and thus give employment to our own population.

APPREHENSION exists in Washington that Texas may act independently regarding border outrages, and thus complicate our relations with Mexico.

## General News Items.

It is reported that some of the Delaware and Hudson Company's mines are on fire.

The Merchants' Exchange Bank of this city has concluded to liquidate and retire from business.

E. K. Smith, Surveyor-General of Montana, has been suspended. The charges preferred are misdemeanors in office.

McDANIEL, one of the New Jersey Central railroad strikers, has been sentenced to pay a fine of \$50, and to remain in the Warren county jail until further orders from the Court.

CAPTAIN Eads, Engineer of the Mississippi jetty scheme, has prepared plans for bridging the Bosphorus, thus connecting Pera with the Asiatic shore. The bridge to be 6,000 feet long, entirely of iron, on granite piers, with a roadway 120 feet above the water.

THE El Dorado deep gravel mining company has withdrawn its proposition from the Water Commissioners to complete a system of water works for this city, on the ground that if iron pipes should be increased a cent a pound in value, the variation would entail an expense of over \$1,000,000.

The *Journal's* Washington special says: The Secretary of War says the President has not said anything about revoking the proclamation for an extra session of Congress, and that the necessity for the meeting of Congress in October is greater than ever. The army appropriation ought to be available by November 1st.

SIDNEY DILLON, President of the Union Pacific railroad, confirms the story that the principal sheps of the company are to be transferred from Omaha to some point towards the western end of the road. No place is specifically indicated, but it is suspected that the new site will be convenient to the company's coal fields.

THE American Anthropological Association, which was organized at the Centennial, and has members from Maine to California, holds its first annual meeting at Cincinnati September 5th, the object being to investigate the pre-historic races of America. Professor C. C. Jones, of Augusta, Georgia, is President, and S. F. Baird, Vice-President.

THE LEHIGH COAL REGION.—A dispatch from Hazleton, Penn., dated the 27th, says: Lindermann, Skeer & Co.'s three collieries at Stockton will resume work, to-morrow, on terms which provide for the restoration of the 12 1/2 per cent. reduction the 1st of September. C. F. Schooner & Co.'s mines, at Beaver meadows, resumed work to day, the 12 1/2 per cent. having been restored, with the understanding that after the 1st of September wages shall be controlled by the price of coal. These arrangements virtually end the strike in the Lehigh region.

## The Department of Agriculture.

There are signs of activity in the Department of Agriculture at Washington, and we hope the Commissioner may accomplish some valuable work. We have heard, by conversation with a friend lately from Washington, that several things which promise well have been undertaken. We are promised fresher work in all the departments. It has been a cause of much regret to us that, in the departments of science related to agriculture, as, for instance, entomology, microscopic botany, and agricultural chemistry, there is seldom any progressive work in these lines credited to the Washington Department, which should be at the head of such inquiries. We trust that this may all be changed, and progressive men or measures, whichever may be needed, may be secured.

We notice that Commissioner Le Duc is doing what he can to learn the needs of the country, and we trust he may be successful. He has addressed a letter to a member of Congress, as follows: "Desiring to further extend the operations and benefits of the Department of Agriculture throughout the Union, it is deemed of great moment to invite the active co-operation of Senators and Representatives from the various States, and through them effect the assistance and sympathy of leading and thinking agriculturalists of their respective sections. I have the honor, therefore, to respectfully request that you will, at your earliest convenience, furnish the Department such information as may be in your power as to the character and diversity of the crops in your section of the State, and possibilities of the soil and climate, and any data of interest on the subject."

## The Locust Plague.

We receive a copy of "The Locust Plague in the United States, being more particularly a treatise on the Rocky mountain locust, or so-called grasshopper, as it occurs east of the Rocky mountains, with practical recommendations for its destruction, by Charles V. Riley, M. A. Ph. D." This monograph by Prof. Riley is a very timely and valuable publication. It is a complete treatise, so far as present knowledge goes, on a subject of great importance in several States, and it makes available to all, facts and beliefs which have been unattainable. The book treats of the characters of the species of locusts, their chronological history, their native home and the regions likely to be visited by them, their habits and power of injuring, their natural enemies and practical considerations, which include the best known way of fighting the pest. Each of these divisions of the subject is treated exhaustively

and with the aid of accurate engravings, and the book will give its reader full possession of "grasshopper science." It is prepared in Prof. Riley's characteristic accuracy and vigor. The printers are Rand, McNally & Co., of Chicago, and from them, we presume, the book could be obtained, if it is not at the book stores. The price, we presume, will not exceed \$1.

The receipt of the present offshoot from Prof. Riley's valuable work makes a remark timely concerning the prospect of his being engaged by Commissioner Le Duc to take charge of the entomological branch of the Department of Agriculture at Washington. We have heard a rumor to that effect, and we desire most sincerely that it may be true. Work like that Prof. Riley has done and can do belongs to the agriculture of the whole country. We want to have him in the service of the whole country, so that we may feel at liberty to call upon him to describe and prescribe for the hosts of insects which are preying upon our crops and destroying our orchards and vineyards. We hope Gen. Le Duc may succeed in winning the service of Prof. Riley.

## Meetings and Elections.

STAR M. CO.—August 23. Trustees—John D. Coughlan (President), George D. Roberts, E. R. Hurko, C. W. Keeney (Superintendent), and L. M. Foulke. William Stuart is Secretary. The Company's property is Cherry Creek, Nevada. Extensive furnaces and hoisting works are being erected for the extracting and working of the ores.

MARTIN WHITE M. CO.—August 25. President, Annis Merrill; Treasurer, Geo. C. Hickox; Superintendent, John Hooper; Secretary, J. J. Scoville.

MELROSE VALLEY M. CO.—August 24. Directors—W. H. Taylor, John P. Kelly, E. V. Jole, Alpheus Bull and Richard Wegener. Officers: T. W. Colburn, Secretary; J. R. Duff, Superintendent; R. Wegener, President, and Alpheus Bull, Vice-President.

STREPTON CON. M. CO.—August 25. Directors—George H. Laws, Leander Sawyer, S. N. Putnam, J. D. Wheeler and Robert Briggs.

WOODWARD'S GARDENS has the following new attractions: The buffalo chase; large scale skeleton; new museum; improvements in the zoological department, besides the other features which have made it popular.

## Signal Service Meteorological Report.

Week Ending August 23, 1877.

HIGHEST AND LOWEST BAROMETER.											
Aug. 22	Aug. 23	Aug. 24	Aug. 25	Aug. 26	Aug. 27	Aug. 28					
39.02	30.04	30.07	30.03	29.58	30.00	30.04					
29.94	27.97	30.03	29.98	29.91	29.96	29.90					
MINIMUM AND MAXIMUM THERMOMETER.											
67	67	70	71	75	03	03					
54	54	56	56	50	53	54					
MEAN DAILY HUMIDITY.											
74	77	76	74	63	82	84					
PREVAILING WIND.											
W	W	W	SW	W	W	SW					
WIND—MILES TRAVELED.											
231	399	319	249	216	307	305					
STATE OF WEATHER.											
Clear.	Clear.	Clear.	Fair.	Clear.	Fair.	Fair.					
RAINFALL IN TWENTY-FOUR HOURS.											
Total rain during the season, from July 1, 1877, 0.02 in.											

## METALS.

WHOLESALE.

THURSDAY, M., August 30, 1877.

IRON.—			
American Pig, ton.	28 00	@	32 00
Scotch Pig, ton.	32 00	@	33 00
White Pig, ton.	28 00	@	—
Oregon Pig, ton.	28 00	@	—
Retined Bar.	30 00	@	60
Horse Shoes, keg.	5 00	@	—
Nail Rod.	—	@	70
Norway, Oval.	—	@	70
Roller.	—	@	—
COPPER.—			
Copper Tinned.	37 00	@	40
Sheathing, lb.	37 00	@	40
Sheathing, Yellow.	21 00	@	22 1/2
Sheathing, Old Yellow.	10 00	@	11
Composition Nails.	21 00	@	—
Composition Bolts.	24 00	@	—
STEEL.—			
English Cast, lb.	14 00	@	25
Anderson & Woods, ordinary sizes.	16 00	@	—
Drill.	16 00	@	—
Flat Bar.	15 00	@	18
Flat Steel.	8 1/2	@	12 1/2
TIN PLATES.—			
10x14 1/2 C. Charcoal.	8 50	@	9 00
Ranica Tin.	24 00	@	—
Australian.	19 00	@	20
ZINC.—			
By the Cask.	11 00	@	—
Zinc Sheet 7x3 ft. 7 to 10, lb.	11 00	@	—
7x3 ft. 11 to 14.	11 00	@	—
8x4 ft. 3 to 10.	12 00	@	—
8x4 ft. 11 to 10.	12 00	@	—
NAILS.—			
Assorted sizes.	3 00	@	35
QUICKSILVER.—			
By the lb.	47 1/2	@	50

## LEATHER.

(WHOLESALE.)

WEDNESDAY M., August 29, 1877.

Sole Leather, heavy, lb.			
Light.	25 00	@	29
Jodot, 8 Kil. doz.	48 00	@	50
11 to 13 Kil.	63 00	@	70
14 to 16 Kil.	63 00	@	70
22 cent Choice, 11 to 15 Kil.	57 00	@	74
Cornellian, 12 to 16 Kil.	57 00	@	70
Females, 12 to 13 Kil.	63 00	@	70
14 to 16 Kil.	63 00	@	70
Simon Ulmo, Females, 12 to 13 Kil.	58 00	@	62
14 to 15 Kil.	66 00	@	70
16 to 17 Kil.	72 00	@	74
Simon, 15 Kil.	61 00	@	63
20 Kil.	65 00	@	67
24 Kil.	72 00	@	74
Robert Calf, 7 and 9 Kil.	35 00	@	40
Kips, French, lb.	40 00	@	45
Cal. doz.	8 00	@	15
French Sheep, all colors, lb.	1 00	@	1 25
Eastern Calf for Backs, lb.	1 00	@	1 25
Sheep Roams for Topping, all colors, doz.	3 00	@	33
20 Kil.	5 00	@	50
Cal. Russet Sheep Linings.	1 75	@	4 50
Boat Legs, French Calf, pair.	4 00	@	—
Good French Calf.	4 00	@	4 75
Best Jodot Calf.	5 00	@	5 25
Leather Harness, lb.	35 00	@	38
Fair Bridle, doz.	43 00	@	72
Siding, lb.	33 00	@	37
Wet, doz.	30 00	@	30
Buff, ft.	17 00	@	20
Wax Side.	17 00	@	18

## Gold, Legal Tenders, Exchange, Etc.

[Corrected Weekly by SUTRO & Co.]

SAN FRANCISCO, August 29, 3 P. M.  
LEGAL TENDERS IN S. F., 11 A. M., 90¢. SILVER, @44  
GOLD IN NEW YORK 104.  
GOLD BARS, 500. SILVER BARS, 93 1/2 @ cent. discount.  
EXCHANGE ON NEW YORK, 1/2; on London bankers, 49; Commercial, 49; Paris, five francs @ dollar; Mexican dollars, 34.  
LONDON Consols, 94 1/2; Bonds, 107 1/2.  
QUICKSILVER IN S. F. by the flask, @ lb. 52 1/2.

SALINAS CITY, CAL., Jan. 23d, 1877.  
MESSRS. DEWEY & CO.—Gentlemen: I received to-day my patent papers for my improved feed-boxes, which you have so kindly worked through for me, and I wish to add my testimony to that of your many other patrons as to your promptness and fair dealing in every respect. Thanking you for prompt attention to business in my case, I heartily recommend you to those in need of a patent solicitor. In preference to the many Eastern firms who flood the market with their circulars and representations of cheap fees, etc. Again thanking you, I remain, respect fully yours,  
J. O. JOHNSON.

## Mining and Other Companies.

Persons interested in incorporated shares will do well to recommend the publication of the official notices of their companies in this paper, as the cheapest appropriate medium for the same.

## California Fruit Growing Association.—

Location of principal place of business, San Francisco, Cal. Location of property, El Dorado Co. Notice is hereby given, that at a meeting of the Board of Directors, held on the fourteenth day of August, 1877, an assessment (No. 6) of \$3 per share was levied upon the capital stock of the corporation, payable immediately in U. S. gold coin, to the Secretary, at the office of the company, 331 Sansome Street, San Francisco, Cal. Any stock upon which this assessment shall remain unpaid on the fourteenth day of September, 1877, will be delinquent, and advertised for sale at public auction, and unless payment is made before, will be sold on Monday, the first day of October, 1877, to pay the delinquent assessment, together with costs of advertising and expenses of sale. By order of the Board of Directors,  
HORACE JONES, Sec'y.  
Office, 331 Sansome St., San Francisco, Cal.

POSTPONEMENT.—The day for deciming the stock delinquent on the above assessment is hereby postponed until Saturday, September twenty-second, 1877, and the sale thereof until Monday, October eighth, 1877. By order of the Board of Trustees.  
HORACE JONES, Sec'y.

## Cherokee Flat Blue Gravel Company.—

Location of principal place of business, San Francisco, Cal. Location of works, Cherokee Flat, Butte county, Cal. NOTICE.—There is delinquent upon the following described stock, on account of assessment (No. 38) levied on the nineteenth day of July, 1877, the several amounts set opposite the names of the respective shareholders, as follows:  
Names. No. Certificate. No. Shares. Amount.  
Conway, E., Balance of certificate No. 39, 45 shares sold for assessment No. 37..... 03 29 \$1 45  
Randall, A. S., Balance of certificate No. 41, 102 shares sold for assessment No. 37..... 95 187 8 35  
And in accordance with an order of the Board of Directors, made on the nineteenth day of July, 1877, so many shares of each parcel of such stock as may be necessary, will be sold at public auction, at the office of the Company, Room 1, No. 402 Montgomery Street, San Francisco, California, on Monday, the seventeenth day of September, 1877, at the hour of one o'clock P. M., of said day, to pay said delinquent assessment, together with costs of advertising and expenses of sale. By order of the Board of Directors,  
O. H. BOGART, Sec'y.  
Office, Room 1, No. 402 Montgomery Street, San Francisco, Cal.

## Dolores Consolidated Mining Company.—

Location of principal place of business, San Francisco, California. Location of works, Wilson Mining District, Esmeralda County, Nevada. NOTICE is hereby given, that at a meeting of the Board of Directors, held on the seventh (7th) day of August, A. D., 1877, an assessment (No. 2) of twelve and one-half (12 1/2) cents per share was levied upon the capital stock of the corporation, payable immediately in U. S. gold coin, to the Secretary, at the office of the company, 418 California Street, San Francisco, California. Any stock upon which this assessment shall remain unpaid on the seventeenth (17th) day of September, A. D., 1877, will be delinquent, and advertised for sale at public auction, and unless payment is made before, will be sold on Tuesday, the ninth (9th) day of October, A. D., 1877, at the office of said company, at the hour of 2 P. M., to pay the delinquent assessment, together with costs of advertising and expenses of sale. By order of the Board of Directors,  
J. W. CLARK, Sec'y.  
Office, Room 2, No. 418 California St., San Francisco, Cal.

## Nevada Land and Mining Company.—Lo-

Location of principal place of business, San Francisco, California. Location of works, Spruce Mountain Mining District, Elko County, Nevada. NOTICE is hereby given, that at a meeting of the Board of Directors, held on the sixteenth day of July, 1877, an assessment (No. 18) of two cents per share was levied upon the capital stock of the corporation, payable immediately in United States gold coin, to the Secretary, at the office of the company, rooms 5 and 6, No. 302 Montgomery street, San Francisco, California. Any stock upon which this assessment shall remain unpaid on Monday, the 20th day of August, 1877, will be delinquent, and advertised for sale at public auction; and unless payment is made before will be sold on Tuesday, the eleventh day of September, 1877, to pay the delinquent assessment, together with costs of advertising and expenses of sale. By order of the Board of Directors,  
WM. H. WATSON, Secretary.  
Office—Rooms 5 and 6, No. 302 Montgomery St., S. F., Cal.

## Washington Blue Gravel Co.—Location

of place of business, San Francisco, Cal. Location of works, Mt. Pleasant Mining District, Sierra Co., Cal. NOTICE.—There is delinquent upon the following described stock, on account of assessment No. 2, levied on the second day of July, 1877, the several amounts set opposite the names of the respective share-holders, as follows:  
Names. No. Certificate. No. Shares. Amount.  
Henry Wichser..... 14 2 \$80 00  
Matty Götter..... 17 1 20 00  
F. P. Muller..... 24 1 20 00  
Nicholas Luchinger..... 27 1 20 00  
And in accordance with law, and an order of the Board of Directors, made on the thirteenth day of August, 1877, so many shares of each parcel of such stock as may be necessary, will be sold at public auction, at the office of the company, southwest corner of Commercial and Leidesdorf Sts., (Britton & Rey's Lithography), San Francisco, on Monday, September third, 1877, to pay said delinquent assessment thereon, together with costs of advertising and expenses of sale.  
HENRY STEINEGGER, Secy.



## Iron and Machine Works.

**PACIFIC ROLLING MILL CO.,**  
SAN FRANCISCO, CAL.

Established for the Manufacture of  
RAILROAD AND OTHER IRON

Every Variety of Shafting,  
Embracing ALL SIZES of  
Steamboat Shafts, Cranks, Piston and Con-  
necting Rods, Car and Locomotive  
Axles and Frames,  
—ALSO—

Hammered Iron of Every Description and Size.

Orders addressed to PACIFIC ROLLING MILL  
COMPANY, P. O. Box 2032, San Francisco, Cal., will re-  
ceive prompt attention. Office: 16 First Street.  
The highest price paid for Scrap Iron.

THOS. PENDERGAST.

HENRY S. SMITH

## ÆTNA IRON WORKS,

MANUFACTURERS OF

## IRON CASTINGS

and MACHINERY

OF ALL KINDS.

Fremont Street, Bet. Howard and Folsom

SAN FRANCISCO.

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Iron and Locomotive Works,

INCORPORATED.....APRIL 30, 1863  
CAPITAL.....\$1,000,000.

LOCATION OF WORKS:

Corner of Beale and Howard Streets,

SAN FRANCISCO.

Manufacturers of Steam Engines, Quartz and Flour  
Mill Machinery, Steam Boilers (Marine, Locomotive and  
Stationary), Marine Engines (High and Low Pressure).  
All kinds of light and heavy Castings at lowest prices.  
Cams and Tappets, with chilled faces, guaranteed 40 per  
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Wm. Norris, Wm. H. Taylor, J. B. Haggin,  
James D. Walker.

WM. H. TAYLOR.....President  
JOSEPH MOORE.....Vice-President and Superintendent  
LEWIS R. MEAD.....Secretary

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## Risdon Iron and Locomotive Works

Corner Howard and Beale Streets,

Are prepared to make SHEET IRON AND ASPHALTUM  
PIPE, of any size and for any pressure, and contract to  
lay the same where wanted, guaranteeing a perfect work-  
ing pipe with the least amount of material.

Standard sizes of Railroad Car Wheels, with special pat-  
terns for Mining Cars. These small wheels are made of  
the best Car Wheel Iron, properly chilled, and can be  
fitted up with the improved axle and box—introduced by  
this company, and guaranteed to outlast any other wheels  
made in this State.

All kinds of Machinery made and repaired.

JOSEPH MOORE, Superintendent.

## PHELPS MANUFACTURING COMPANY,

Manufacturers of all kinds of

Wharf and Bridge Bolts, Railroad Trestle  
Work, Car Frames and Bolts, Machine  
Bolts, Set Screws and Tap Bolts,  
Lag or Coach Screws.

ALL STYLES OF FANCY HEAD BOLTS.  
HOT AND COLD PRESSED HEXAGONAL AND  
SQUARE NUTS, WASHERS, BOLT ENDS,  
TURNBUCKLES, ETC., ETC.

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Hydraulic Pipe, Oil or Water Tanks, Ore and  
Water Buckets, Gasometers, Grinders, Bridges  
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CRUSHING ROLLS AND ROCK BREAKERS. ALSO, WATER JACKET SMELTING FURNACES,  
FOR REDUCING LEAD, SILVER AND COPPER ORES, QUICKSILVER FURNACES,  
RETORTS AND CONDENSERS, ROASTING AND CHLORIDIZING FURNACES,  
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GEO. W. FOGG, Supt.

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Light and Heavy Castings of Every De-  
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The Only Illuminating Tile Manufactured for Light-  
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plings and Connections of all sizes and patterns, furnished  
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Manufacture Iron Castings and Machinery  
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Of all sizes—from 2 to 60-Horse power. Also, Quartz  
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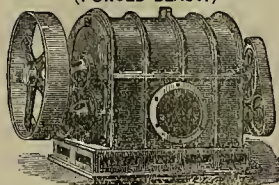
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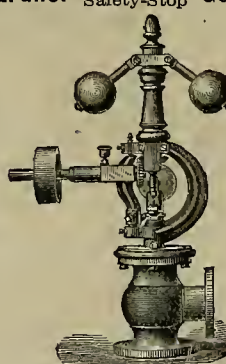
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power, labor and repairs, and do more work than any  
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handled, being light, and has AUTOMATIC FEED, which  
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## CHLORIDIZING FURNACE

Guaranteed to Chloridize from 85 to 95 per cent. of any  
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ing. Will also desulphurize ores and put them in proper  
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Cost of Roasting and Chloridizing 20 Tons  
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One man.....	\$ 4 00
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Wood—2 1/2 Cords at \$3 per cord.....	5 25
Salt—1,600 lbs at 2 1/2 cents.....	40 00

Cost of 20 tons.....\$52 25  
Cost of one ton.....2 61 1/4  
In a furnace of three or four times this capacity the  
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The furnace is now working successfully at the Poe Con-  
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And other base metals, or to ores free from base metals.  
It can be adapted to any first-class Gold or Silver mill, at  
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AWARDED FIRST PREMIUM

At the Tenth Industrial Fair of the Mechanics' Institute



It may be considered as now fully demonstrated, by careful and long-continued experimentation, that the plan upon which a perfect ore feeder must be constructed is that of the carrier, and not that of the shaking table. Uniform and accurate feeding is not possible upon the latter plan. The ore must be evenly carried, upon a steadily advancing plane or table, to the line of discharge, and there simply dropped. Spasmodic or jerky contrivances will not answer the purpose.

We warrant the machines to give perfect satisfaction, and to be a better and more durable Feeder than any other in the market, and will sell them as cheap as any other of its class.

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O. H. Bogart, 402 Montgomery St., San Francisco, Cal.  
Bardwell, Walter & Co., 408 California St., S. F., Cal.  
Haggin & Tevis, 50 Nevada Block, San Francisco, Cal.  
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Silver King Mining Company, Arizona.  
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Crescent Mine, Plumas County, Cal.  
Hidden Treasure, Deadwood, Black Hills.  
S. B. Schronitz, Del Norte, Colorado.  
Little Anna Mine, Colorado.  
Briggs Bros., Black Harker, Colorado.

Ontario Mills, Parley Park, Utah.  
Julian Mill, Newcastle, Placer County, Cal.  
St. Patrick Mining Company, New Castle, Placer Co., Cal.  
Bunker Hill Mill, Amador County, Cal.  
Gover Mining Company, Amador County, Cal.  
Talisman Mining Company, Amador County, Cal.  
O. C. Hewitt, Keystone G. M. Co., Amador City, Cal.  
Boston Mill, Gold Hill, Nevada.  
Soulby Mill, Tuolumne County, Cal.  
California Company, Nevada County, Cal.  
Omaha Gold Mining Company, Grass Valley, Cal.  
Star Mine, Sonora, Tuolumne County, Cal.  
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S. D. B. Stewart, Lincoln G. M. Co., Sutter Creek, Cal.

"CHALLENGE ORE FEEDER.—\$1,000 Challenge Ore Feeders and the Tulloch Feeder.—A letter has been received from the Crescent Mine, Plumas County, which states that the Tulloch is a failure as against the \$1,000 Challenge Feeder.  
The Tulloch Ore-Feeder, after having been in use for about six months in the "Gold Stripe Mine," at Greenville, Plumas County, Cal., has also been superseded by the \$1,000 Challenge Ore Feeder.

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Backward in Coming Forward.—Challenge is Still open. Gentlemen, Put up or Shut up.

For Description, Send for Circular to

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WHERE IT CAN BE SEEN IN OPERATION. Also, Manufacturer of

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At the highest prices; also, treated on Commission at low rates.

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50 FINE CARDS, Damask, Repp, Etc., with name on 13 cents. CLINTON BROS., Clintonville, Conn.

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Gas House Tiles, Fire Bricks, Blocks, Etc. Ground Fire Brick, Fire Clay and Fine Sand always on hand. Assay Muffles and Furnaces, Cupola Bricks for McKenzie and other cupolas.

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For a small amount, in several claims on one of the

RICHEST LEDGES IN ARIZONA.

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65 LARGE MIXED CARDS, with name 10c. and 3 ct. stamp. 25 styles Fun Cards, 10c. Samples 6c. M. DOWD & CO., Bristol, Conn

MINERS, write for your paper.

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For Steam Boilers, Pipes, etc. Best non-conductor of heat in use. It effects a LARGE SAVING OF FUEL, LASTS AS LONG AS THE IRON to which it is applied, and is reasonable in cost.

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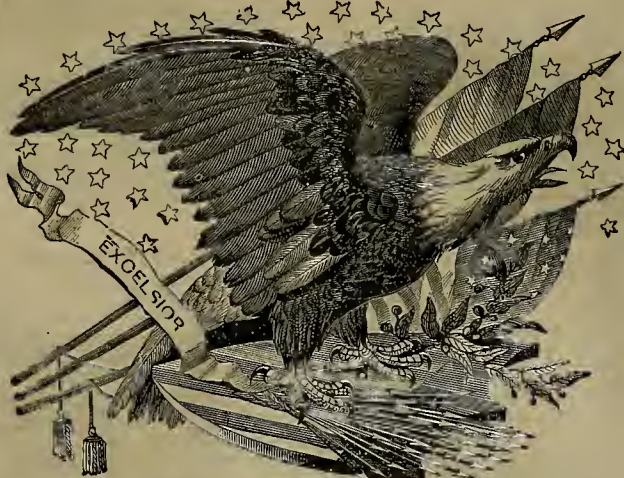
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GEO. G. BUCKLAND

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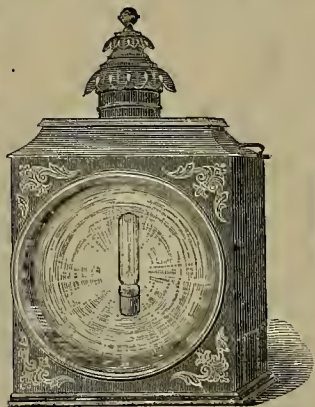
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# MINING AND SCIENTIFIC PRESS.

An Illustrated Journal of Mining, Popular Science and General News.

BY DEWEY & CO.,  
Patent Solicitors.

SAN FRANCISCO, SATURDAY, SEPTEMBER 8, 1877.

VOLUME XXXV.  
Number 10.

## Another Industrial Enterprise.

In the face of the many large carriage dealing and manufacturing establishments on this coast, the starting of another in that line any time within the last four years required a great deal of nerve and business energy, and to be successful also called for capital. The California Carriage Manufacturing Company, seeing yet many idle mechanics, and seeing, as they believed, an opening for first-class vehicles, conceived this idea of starting their present business in 1875, and thereupon formed their company, consisting of Messrs. W. L. Pritchard, Georgs Cowles and C. Zimmerman, and selected Sacramento as a favorable place for their operations. The selection of the place was ruled by climatic considerations. It is a well known fact that wagons put up in the damp climate of the coast, when taken to the hot interior valleys, soon shrink so that the iron gets loose upon them, and the joints of wood do not fill, thereby weakening the whole immeasurably. The Sacramento climate being essentially identical with that of the whole interior of the State, it followed as a natural and logical conclusion that what was put up dry and tight there would remain tight, solid and unaffected by the heat of other sections. Sprinkling of felloes, loosening of spokes, dropping of hubs, bands, etc., is what they wished to avoid, and they have done so.

Having selected their site, the building was put up with a special view to accommodate an extensive business, and with the least expenditure of labor during the manufacturing period. In fact the whole building was built for the business, not the business for the building. Everything is convenient and economical; no power or time is wasted on material from the time it goes into the building as plank, wood and leather, until it comes out the finished vehicle. The building has a frontage of eighty-eight feet on K street, and one hundred and sixty feet on Eighth street, with plenty of yard room outside on the lot, which is much larger. On the first floor we find the motive power of this machinery of the whole establishment, consisting of a steam boiler and engine of forty-horse power, which runs the elevator, steam forging hammer, hand-saws, lathe, planer, etc., all of which are used to supplement the usual bandwork. Here the forging, tempering and shaping of the celebrated Doland & Scherb C spring is done, which is a specialty with this company.

Stepping on the 18 x 14 foot elevator platform, up we go to the second floor. On this floor, at the corner of K and Eighth streets, is the business office, and a large and commodious show window, in which are exhibited light buggies, skeleton trotting wagons and sulkeys, sets of harness, robes, whips, etc. The main room of this floor is used for getting out the wood and running gear of carriages, and setting them up. Here we find a smaller band saw, capable of cutting the most beautiful scroll work, or sawing wood into the most intricate shapes and patterns, to be used in the manufacture of vehicles, or for any other desired purpose. Here also are two circular or splitting saws; a hand planer; boring and mortising machine; turning lathe; moulding machine, and every appliance and tool for the artistic working of woods.

Ascending again, we reach the third floor, where are to be found the various shapes, patterns and sizes of vehicles they manufacture, ready to run when the proper horse is hitched to them. Using the finest taste in selection of style, yet they are ready to defer to the judgment of any customer, and give him what he wants. They usually keep in stock \$50,000 worth of vehicles from which to select.

Again having recourse to the elevator, we ascend to the fourth floor, where the painting, varnishing, upholstering and general finishing touches are given to their carriages and buggies. Employing none but the best high priced workmen, the best selected material in the United States, the most talented and finished workmen in the upholstering and painting departments, and applying all the known aids to mathematical certainty and expedition that invention affords, it would certainly be a miracle if a poor

wagon or buggy got out of their shop. That such a miracle is unheard of after two years' search, is the best of evidence that miracles have ceased to occur.

The "California Carriage Manufacturing Company" is prepared to manufacture anything that runs on wheels, from a baby-wagon to a street car. They are now turning out thirteen cars for the new California street railroad of this city, and others for Sacramento. They are also turning out a splendid omnibus for one of the city hotels. They are prepared, and have facilities for manufacturing, any kind of agricultural implements. Their farm wagons are unsurpassed, and from a wheelbarrow to a sixteen mule wagon, they are ready to supply orders, which, for durability and finish, cannot be surpassed by any institution anywhere. The interior of the State is being dotted with their highly finished family carriages, buggies, etc. Nevada and Oregon are sending their orders, and not to have one of these carriages, with their patent "Doland & Scherb" steel springs, is to agree that you do not know what comfort and pleasure there is in riding in one of these in

## Items of Interest from the Mines.

We give below items of interest from prominent mines, most of which are collated from letters of the respective Superintendents on file at the offices in this city:

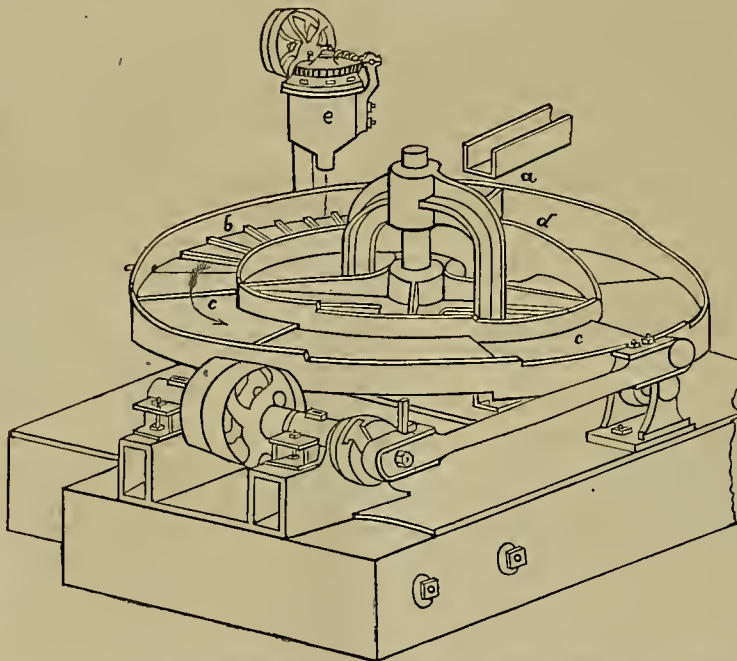
At the De Fres mine, this week, they will commence sinking main shaft. After the station shall have been timbered, sinking and driving on 210-foot level will be carried forward at the same time. The company's mill is nearing completion. Everything in and about the mine is going well.

No improvement is reported from the Empire (G. V.) mine. The ground is hard and the ledge small.

The 1150-foot level station of the Utah is being enlarged.

Work has been commenced on the new mill for the Navajo mine.

The main shaft of the Grand Prize has cut into the ledge, about three feet in width; flow of water strong.



KUSTEL & HOFFMAN'S IMPROVED AMALGAMATOR.

preference to the other back-breaking institutions which have been in use, but are fast being numbered among the things that were. We tried one of these last week around Oakland and out to Piedmont springs, where the road was full of holes and chucks, and must say that they are the easiest riding buggies we ever saw. A succession of cradle holes just gives them a gentle swinging motion—no bouncing and teeth chattering, like the elliptic springs.

**BULLION SHIPMENTS.**—Since our last issue shipments of bullion from prominent mines have been as follows: Northern Belle, August 28th, \$6,216; California, 31st, \$141,905.93—total to date, \$1,067,820; Con. Virginia, Sept. 1st, \$152,387.19—total to date, \$1,007,061; Empire (G. V.), Sept. 1, \$11,000; Tybo Con., Aug. 25th, \$4,305.48; Leopard, Sept. 3d, \$9,000; Grand Prize, 3d, \$21,500; Minnetta Belle, 22d, \$6,500—total for August, \$29,500; Endowment, 5th, \$2,948; Tybo Con., Aug. 30th, \$8,407; Sept. 1st, \$3,985—total for August, \$54,165.

**NEW IDRIA.**—Attorney General Devens has given an adverse opinion to the New Idria mining company's request that the question of title to the quicksilver mines be reopened before the Interior Department. This will leave this celebrated case to be settled by this courts and Congress.

## Kustel & Hoffman's Amalgamator.

The accompanying engraving represents an amalgamator of a new and very simple construction, at present in daily operation at the Mechanics' fair. It is an improvement devised by Mr. G. Kustel and O. Hoffman, to overcome the difficulties in the amalgamators at present in use.

The amalgamator forms a ring with an amalgamating surface and copper plates. This ring is divided by a cross partition, on one side of which are rifles filled with quicksilver. The balance of this arch is laid out with horizontal amalgamated copper plates, *b*. These plates form several steps, as seen in the cut. On the other side of the partition, at the end of the copper plates, is the outlet for the tailings, at *d*. The pan or amalgamator receives an oscillating motion of about 240 revolutions per minute.

The iron vessel, *c*, is not necessarily connected with the amalgamator. It contains sodium amalgam; and the mechanism is so arranged as to discharge, every minute, a few drops of sodium amalgam into the rifles, keeping the quicksilver always active. This apparatus is used where the gold is coated with a brown or reddish color and very difficult to amalgamate.

The quartz, in case of wet crushing, is conveyed directly from the battery on to the quicksilver in the rifles. This quicksilver is kept in lively action by the oscillating motion of the pan, so that the pulp is kept constantly in contact with a perfectly clean surface, causing a very effective amalgamation, even of "float gold," which cannot escape frequent contact with this mercury. Although the motion is very brisk, no "flouring" whatever occurs to the quicksilver.

Passing over the rifles the ore comes, very evenly spread, over the copper plates, and moves with considerable friction on the horizontal surfaces, the sand being perfectly loose, so that all heavier particles reach the plate from the start. Particles of gold that might have escaped the rifles and the plates will find another favorable amalgamating place at each step, owing to a slight concussion when dropping from one step to another.

The application of coppered and amalgamated canvas, now experimentally substituted for copper plates in the pan, is quite new, and its practicability must be proven by more continued use; but as to saving gold, it seems to be much superior to ordinary copper plates. The roughened surface catches the amalgam and quicksilver better than smooth copper. Mr. Kustel proposes to make future machines a little larger than the one exhibited at the fair.

This amalgamator can be used to great advantage in saving quicksilver and amalgam in silver mills, if attached to the settlers. All quicksilver and amalgam that might escape the settler will be saved, and, considering the loss of many thousands of pounds of mercury daily, in treating silver ores, this amalgamator deserves special attention and consideration of those interested in silver mills. For the separation of gold from concentrated or unconcentrated black sand, there seems to be no amalgamator that could answer the purpose better, as it retains the gold entirely free of black sand. The capacity of a pan six feet in diameter, offering 184 square feet of amalgamating surface, is from six to eight tons in 24 hours, according to the density of the stuff. The device for feeding the pan, in use at this fair, is very efficient, as both water and pulp can be gauged accurately. The machine works very nicely and our mining friends will do well to examine it. Those desiring further information may call on, or address, Messrs. Kustel & Hoffman, at 210 Front street, in this city.

THERE were a number of mining accidents on the Comstock, last month. In all, 15 men were injured, six of them receiving their death wounds.

CAPTAIN RAPHAEL SEMMES, who commanded the privateer *Alabama* during the civil war, is dead.

**SUTRO TUNNEL.**—We have received a very unique profile map of the Sutro tunnel, compiled from official sources, and drawn by Kerchoff & Specht, 1053 Harrison street (P. O. box 1220), in this city. Outside of its value for reference, it is a good specimen of sunlight printing. On the profile are tabular statements giving all the details for each month in which the work has progressed, which seem to be carefully compiled, and are of great interest. In our next issue we shall speak of this subject further.

A FIRE at Auhorn, Placer Co., this week caused a loss of \$75,000; insurance, \$25,000.



### A Reception to Distinguished Scientists

On Thursday evening, of last week, a special meeting of the California Academy of Sciences was held for the purpose of extending a welcome to California to Sir Joseph D. Hooker, C. B., President of the Royal Society, England; Dr. Asa Gray, Professor of Botany, Cambridge University, and Prof. F. V. Hayden, U. S. Geologist. Prof. George Davidson, as President, had Sir Joseph Hooker seated on his right, and on his left Dr. Gray and Prof. Hayden. Mr. Henry Edwards, Vice-President of the Academy, and several other officers, completed the platform group. Since the memorable reception of Agassiz, no event of a like character so notable has occurred in the history of the Academy.

Prof. Davidson called the meeting to order, and addressed the guests as follows:

This special meeting of the California Academy of Sciences has been called to welcome to our coast the distinguished scientific gentlemen who are present with us this evening.

It has been our privilege and our pleasure, upon former occasions, to extend kindly greetings to others who have established their reputations for good work, and honest work, and hard work; yet, among the best, none stand higher than our guests of to-night.

Sir Joseph Hooker's name is well known to you all, "but is familiar as a household word" to those who have devoted their special study to botany. For half a century he has given his life-labor to that branch of science, which his father so ably advanced; not only the labor of the closet and the conservatory, but the work of the field, where broad views of nature expand the active thought, and give it marvelous breadth of grasp and wonderful capacity for logical deduction.

The search for truth for truth's sake is the irresistible impulse and spur of every scientific inquirer; but human nature is universal, and it is a peculiar satisfaction to us to know that men and women who are working and thinking in other and varied lines of business are willing and ready to appreciate earnest and honest scientific thought, and the full credit which is accorded to Sir Joseph in all the countries and nationalities of the world must be accepted as some small measure of recognition of his eminent ability and extended labors, whilst the honors which have been accorded to him at home militate against the antiquated idea that a prophet hath no honor in his own country.

This is the second time that Dr. Asa Gray has visited this coast, and we feel like entering a special protest against his short and hurried stay, and particularly at his coming during so unfavorable a season for botany.

In the future we shall endeavor to keep him thoroughly "posted" in the predictions of the weather-wise, in order that he may reap the full fruition of his searches.

We greet him with kindly feeling, and with a flush of pride, as representing the highest level of botanical knowledge in America; and as fully perceiving and elaborating the inevitable law of evolution in the flora of the earth.

You have so often heard the trite remark that science knows no nationality, that sometimes just the shadow of a doubt must arise of its truthfulness by its continued iteration; but had you witnessed, as I did the other day in the country, the juvenescent hilarity, and enthusiasm, and fraternity of our two friends over every rare flower, grass or plant; over your laurels and your oaks; your redwoods and your cypresses; you would have been thoroughly satisfied that the millennium of science was not so mythical as imagined.

I do not dare to betray all the joys and pleasures of that day. It is marked by a great red mark in my labors. I forgot all about Mars and Venus, irrigation, breakwaters and reclamation, triangulation, topography and hydrography, until our last, but not least-respected guest, Prof. Haden, waked me from my big holiday by demanding to know some of the details of the geology of that part of San Francisco peninsula along which we were being so handsomely driven by one of our life members. Fortunately for me, we were too far away from the rocks to misver my statements. But I was astonished that one of the *finest* geologists, and one of my best friends, should try to entangle me just where I was weakest!

Prof. Hayden: I greet you as a man who is doing some of the most valuable geographical and geological work upon this continent, and doing it with an energy, and a vim, and a perception that must lead to the broadest results. Three years since I spent a day examining your work, then being reduced to paper, and was more than gratified to see that you had the faculty, not only of execution, but of administration, by surrounding yourself with men efficient in their specialties. The publication of your results will furnish proof positive of the character of your work, and will bear testimony, at home and abroad, of the deep interest this country takes in the development of its great physical features and resources.

All the sciences form but a chain, and our botanical friends will be able to study with advantage your extended maps, in order that the peculiarities of the flora of Colorado, of the regions of the Yellowstone, may be properly appreciated and fully comprehended.

It was my pleasure to first bring, for the inspection of the Academy, advance copies of the photographs you obtained of the wonderful and then unknown region of the Yellowstone; since then, your published works are familiar to us all.

Gentlemen, I wish I had that rare gift to express, as fully as I could wish, all that I feel in kindness toward you, and in admiration of your abilities. I beg of you to take the assurance for the expression thereof.

#### Henry Edwards's Address.

Mr. Henry Edwards, the eminent entomologist, Vice-President of the Academy, was called upon, and spoke as follows:

"I can add but little to the generous welcome offered to-night by our worthy President to the distinguished men who have honored us by their presence this evening. But, as an humble student of the science which two of them have made illustrious, I may perhaps be permitted to add a small leaf to the many garlands with which they are already crowned.

Wherever the name of botany is known, and the love of the gentle pastime of cultivating flowers is cherished, the names of Hooker and Gray are alike appreciated and loved. It is to such men as these that we owe our knowledge of what beauty lies in the plants which adorn our landscape and give a charm to the surroundings of our homes. They deck the familiar walk with a novel beauty, and adorn the untrodden path with a new and undreamt of grandeur. Over the dense and impenetrable forests, which here and there mark the surface of the world, they cast a halo of the poetry which is essentially their own—the poetry which clings to science as its sister—and which forwards its progress as the dewdrop helps onward the growth of the tree.

With the true brotherhood which exists among men of science over the world, these two have joined hands together and worked for the accomplishment of a purpose, nobler than is usually believed. The interests of science are the strongest bands which can bind nations together, and should the amicable relations now existing between the United States and England be ever broken (which God, in His mercy, prevent) the inherent love of the people for each other would be held together by the tender chains which science weaves, and the union of such men as Hooker and Gray would cement them beyond the power of national quarrels to separate.

What are Canadian fisheries and Alabama claims to them? The grand old pines of the forest wave their branches and sing their eternal song, and the dainty flowers, springing forever from the grass, still offer their petals to him who seeks to learn their hidden wonders.

Fortunate, as we are to-night, to have the honor of greeting our illustrious guests, still more fortunate will those be who come behind us in the after years, who will reap the benefit of their precious labor, and drink to its fullest depth of the fountain which they have laid open to our gaze. Foremost are such men among the benefactors of the race, and it will be a happy memory in the hereafter of San Francisco that she has been allowed the privilege of tendering her respect to such instructors, such noble specimens of humanity, as the men whom we greet to-night as our fellow-laborers and as our friends.

Mr. R. E. C. Stearns, Secretary of the Board of Regents of the University, spoke in a humorous vein of what the representatives of science might explore here in addition to the botany of the coast.

#### Sir Joseph Hooker

Returned thanks for his welcome. He came here to learn, and not to teach, and his visit was immediately due to the experience of his old friend, Prof. Gray—a friend of 40 years' standing—and to the invitation of his old correspondent, Prof. Hayden, whose guests they had been during the time they spent in Colorado and Utah. His acquaintance with the vegetation of America had heretofore been an extremely slight one. In association with his father's pursuits, who was for many years occupied in publishing investigations of the plants of the British possessions of North America, he was led to the investigation of the Arctic flora. In the investigation he was struck with the uniformity of vegetation on going round the whole globe in the North. There was very little difference between the vegetation of America and the Old World within the Arctic circle; but upon close examination he found that even the American flora was divisible into two sections by very slight but still definite characters; that in crossing over from Greenland to the American islands, so-called, there was a distinct change in the vegetation, though very slight.

The opportunity he had now had of crossing the continent of North America from east to west, had shown him that that distinction is carried out to a very much greater extent than he had any notion of. The publications of Gray and others had made him aware that there is a broad line of distinction between the vegetation east of the Mississippi and west of it; but he did not expect to find the variety so great as it is, and he was strongly inclined to say, though he said it under correction, that there is probably a greater difference between the east and west coast of the American continent than there is between any two similarly related regions in any part of the globe; that you may travel from England to Spain, from Siam to China, without finding so diverse vegetations as by crossing the Mississippi and comparing the banks 100 miles east on one side with 100 miles west on the other. As far as the country east of the Mississippi is concerned, he was, by practical observation, almost entirely ignorant. He knew nothing of it except from the copious notes of Prof. Gray conned while traveling. Since then he had the opportunity of spending some

weeks in the Rocky mountains and then of coming here, and he found a more curious difference than he had anticipated in the vegetation between the Rocky mountains and the Sierra Nevada. He had every reason to suppose that this great difference of vegetation exists south of the parallel along which he had traveled. Time had not allowed them to digest the notes collected on the way, and more than he had announced he was not prepared to say. The President had asked to say a few words with respect to the Academy. In England they knew well enough what it is to wait for results; but he might be believed when he said that the destinies of science on this coast are great, and a time will come that will show great results, and that will come with immense force, and for these two reasons: There is here a most intelligent and a most active and progressive population, and, in the second place, there is here one of the most remarkable assemblages of natural objects and physical phenomena that any part of the world possesses. In speaking thus, he included the whole coast, north and south, of California. There is no section of the earth in which so many singular phenomena can be observed as in this. Without seeking to give advice, he might point out what has been the element of success in the greatest academy of England, the Royal Society. It began with very few men, and, for the best part of two centuries, it was supported by what he might, without disrespect to his ancestors in science, call elderly people. It was by the elderly men who loved science, holding together congenially year after year, and almost century after century, that the young men of the society were drawn to it, and it is but lately that young men in any numbers have come into the society. For success there are three principal elements—the holding together of the elderly members, of those who have had experience of this life in other matters than science, and who bring that experience together, with methodized common sense, of which science consists, to bear upon the objects of the society itself. In the second place, there is the important work of the Secretary, together with that of the Publication Committee, which should carefully pass judgment upon the communications to be given to the world. The supervision of the papers of a society by several members is perhaps the most important scientific work that any society can perform. Thirdly, there is the necessity of looking well after the funds, and managing them with economy and prudence.

Prof. Davidson thanked Sir Joseph for his advice, and said the Academy is aching now for the young men of the country to come in and take the place of the elderly members.

#### Dr. Gray,

In acknowledging the kindness of the reception, said it is almost 40 years since Sir Joseph and himself spent some few hours together in the neighborhood of London, at the table of the then very venerable man, long since gone to his rest, Archibald Menzies, who was surgeon and naturalist of Vancouver's voyage. The interest in the venerable gentleman arose from the fact that he had been round the globe, and particularly had visited this part of it, and he was the first English naturalist, and almost the first naturalist, who set foot on this part of the continent. Partly through Prof. Davidson's investigations he had been enabled to trace the footsteps of Menzies, whose name is merged in many of our plants, the madroña for instance. He had found that he was in San Francisco, at the Presidio, and that he found his way as far as Santa Clara or San Jose, and it is very well known that he visited the point which was then the oldest settlement; that he landed and botanized at Monterey. It was with peculiar pleasure that they had followed in his footsteps at Monterey, and had been able to gather some plants and to see the withered remains of others that he first made known to the civilized world. Monterey is also the spot that some earlier naturalists visited, where the Spanish naturalists, Mocino and Lesse, collected plants, and also the Russian naturalists, Chamisso and Eschscholtz, whose names are familiar to all our gardens—household names in plants. The season of their visit to the coast had proved unpropitious on account of the great drought, and what is still worse, the ravages of the great flocks of sheep, which have devastated the herbage vegetation of the Sierras. Fortunately the forests remain, the most important vegetation in respect of climate, geographical distribution and utility. They had been very busy, and their work had not been in vain. They would be enabled to make some interesting comparisons, after visiting the Rocky Mountain region, and to settle, from observation in the field, some of the questions they had sought to settle in the laboratory and the conservatory. Dr. Gray, in conclusion, referred to his visit five years ago, and the great pleasure it had given him to have as companion his old friend Joseph Hooker.

#### Professor Hayden

Indicated the features of the geological survey in progress under his direction, and said he has long desired to make some comparison between the Sierra Nevada mountains and the Rocky mountains. It had always been his belief, although the belief has been corrected by his studies of the Eastern slope, that there is a general geographical as well as geological unity in all the different ranges of mountains that compose our country. Other geologists have endeavored to give to the Sierra the name of the Cordilleras, as a generic term, extending it to the Andes and to the Eastern range, the Rocky mountains. Other geologists have sought to

make the Rocky mountains the generic name, including in that range all the rest, and making the Sierra Nevada a branch. He was now inclined to think there is difference enough in the two ranges to regard them as separate, and perhaps almost independent ranges. One object of his visit was to examine the Yosemite valley and study the phenomena of its formation, and this he had been enabled to do. At some time he hoped to be in a position to study the geology of the coast generally.

Prof. Davidson then made some practical remarks on the subject of the ocean currents on the coast, with reference to their influences on climatology, and the distribution of species. His experience in prosecuting the work of the coast survey has given him special advantages for observation in this direction, and his remarks were listened to, with interest by the audience.

### Mining in Butte County.

Butte county has yielded millions of dollars in mineral wealth, and still her area has not begun to be developed. At the present time there is an increased activity in mining operations, and we hear of numerous mines that are being worked with profit to their owners. Moneyed men are just beginning to see that mining can be made a profitable industry. Capital is being attracted here from outside the county. Men of intelligence find that mining pursued as a legitimate business can be made to pay. Nerve, energy and means are prerequisites for success. We hear of quite a number of instances where private individuals are working their mines with profit. Now the field is large enough for others to enter, and it should be improved. Men of moderate means can combine and work in a small way at first. As soon as they get something ahead they can enlarge their sphere of operations.

We have often thought that the lava beds in this vicinity could be worked as advantageously by white men as by the Chinese. As it is now, the Mongolian monopolizes the ground, and not a few of this servile and despised race acquire wealth from their operations. Thousands of dollars are taken out by them every month, and but few if any, of the white race, seem disposed to work these lava beds in competition with them.

Mining judiciously and economically pursued can be made a profitable industry in this county. There are acres and acres of good mining ground lying idle. There are miles and miles of gravel ridges which have never been prospected. There was never a better investment than a good gravel mine. It is a paying institution. All of our bill diggings are rich in wealth, but the scarcity of water has prevented them from being worked to that extent which we expect to see one of these days, when water will be plentier. There are places in Feather river which would pay well if worked. The river has not been so low for many years, and there was never a better time afforded for ascertaining where the gold is to be found than the present. A few men of capital have already started the ball in motion, and we anticipate good results. Others will follow. With improved mining machinery, such as is now being introduced, the mining outlook in Butte was never more promising. Our business men and laboring classes have certainly good reasons to congratulate themselves. All new mining enterprises should be encouraged, and a helping hand given to those engaged in their prosecution. Every new enterprise is a positive benefit to the community, adding to its prosperity, and relieving the burdens of taxation, which, at the present time, are so hard to bear.—*Oroville Mercury*.

### A New Concentrating Mill.

The Sunshine (Colorado) *Courier* says: On Tuesday we visited the fine new mill property of Everitt, Haberlin & Co., on Four-Mile. This mill has been put up and started to running within the last two months, and as it is now the nearest concentrating works to Sunshine, it is a matter of the first importance to this camp and others near by to know what the mill is doing toward making the low-grade ores a profit to the miner.

The partners in the new mill are W. A. Everitt, F. Adams and Mr. Haberlin, but the latter is not at present in Boulder county. The mill is a neat frame structure, and contains ten stamps and four true belts. Five men are employed to run it, three on the day shift and two at night, and they can concentrate from ten to twenty tons a day, according to the nature of the mineral. As an extra precaution against losing any of the mineral, they use four tanks for catching the float mineral, the refuse water passing from one to the other. The experience of several weeks running has proved that the firm can get all the expenses of concentrating out of \$11 ore, and when the hauling does not cost over \$1.50 per ton, they can treat \$15 ore at a small profit to the miner. Ore that will actually run \$25 they offer to buy, giving the miner a percentage. The run so far has been principally on Melvina ore, and about 16 tons of Grand View low grade. The road from Sunshine to the mill is a steep one, but it all tips the right way, and can be easily passed. The mill is situated about a mile and three-quarters from this camp by the road, and if the low-grade ore at the numerous mines within half a mile of us will run \$25, \$30 or \$40 per ton, as is so frequently stated, this is the opportunity to utilize it.



## MECHANICAL PROGRESS.

## A Screw Ventilator.

Whether old Archimedes thought his screw could be employed to lift bad air out of "public buildings, dwellings and cow-houses," may be a question, but thus it has been applied. We read of an English invention in which a screw, made to revolve within a cylindrical casing, will cause a current upwards or downwards according to the direction given to the thread or blade. In this case the direction is, of course, upwards; and the screw is arranged on a spindle. The spindle is prolonged upwards, and to its top is attached a dished hood provided with vanes, which are acted upon by the wind, thus causing the spindle to revolve. Between the hood and the screw are other perpendicular vanes, arranged round a circumference about equal to the screw casing. These vanes contribute to the motive power; also allow of the escape between them of the vitiated air withdrawn by the screw. They are disposed so as to overlap each other, while at the same time allowing a space between, in such a way as to exclude hail, rain, snow or dust, while they also prevent any down draught. The centers of the spindles are conical and of steel hardened by a secret process, revolving in steps of the same substance; they run in oil cups, the reservoirs of which contain enough oil to last for eight to ten years. Indeed, we are informed that some ventilators on this principle have been run without attention for 14 years. The consequence of the friction being thus reduced to a minimum is that the ventilators will revolve with the least breath of wind, and meteorological records inform us that the wind is never absolutely still; so that, with these appliances, we may rely upon a constant changing of the atmosphere in the room to which they are applied. There is an arrangement for driving the screw by power when very active ventilation is required, especially for expelling accumulations or large quantities of hot air and sulphurous gases; dirt, dust and waste flyings; and injurious effluvia from gasing and other workrooms.

**AUSTRALIA AND AMERICA.**—A correspondent, writing to *The London Times* from Sydney, says: "Our appearance at Philadelphia has drawn the attention of American manufacturers to us in a most marked and unexpected degree. A country that, like New South Wales, is rolling in wealth, must be a country that is able to buy, and a country that is able to buy is exactly the country that American manufacturers have been anxiously looking out for. Our representatives at Philadelphia have come back strongly impressed with the fact that there are many things the Americans can supply us with advantage. Our government has an offer from Messrs. Baldwin & Co. to furnish a locomotive engine for about £1,000 less than the cost of an English engine, and to leave the payment open until the engine has been thoroughly proved and approved. A Pullman's sleeping car and an ordinary passenger car have already been ordered, and American wheels, axles, rails, and brakes are strongly pressed on our acceptance. As our government engineers are all of the English school, American novelties will have a hard battle to fight to win official acceptance, but the demand for economy in railway construction and working is so great that people and Parliament will press on the Minister for Public Works a fair trial for any American novelties that may seem to be suited to our wants. The English manufacturers, therefore, who have hitherto supplied us, must look to their laurels."

**BRONZE FOR VALVES AND COCKS.**—The question of the best alloy for steam-engine valves and cocks has been discussed before the Vienna Association of Mechanical Engineers. The following were submitted as the most durable alloys: I. Copper, 84; tin, 2.9; zinc, 8.3; lead, 4.3; iron, 0.4. II. Copper, 83; tin, 17. III. Copper, 80; tin, 18; zinc, 2. If after casting, and while still red hot, cold water is poured over the bronze, it becomes harder and finer in grain, and tougher, as the tin, instead of separating out, as happens when the bronze cools slowly, remains mixed, and the alloy retains its compactness. The toughness and quality of the bronze are stated to be very considerably increased by this method of treatment, to which the alloy No. II. is more especially susceptible.

**PRIZES FOR ALLOYS.**—The Council of the Prussian Association for the Promotion of Industry announce that they will award the following prizes this year and next: For the best series of alloys of iron and manganese, £100; for a process for separating cyanide and ferrocyanide of potassium from sulpho-cyanide of ammonium by means of potassium compounds, £50; for a process for utilizing anthracite oils in the preparation of aniline and alizarin, £75.

**CLEANING IRON WIRE.**—Betz, of St. Ingbert, has constructed an apparatus for freeing iron wire by mechanical means from forge scale. The process consists in drawing wire over rollers, which remove the scale from it on each of its sides by mere pressure, the last step in the process being to pass it through a box containing sand and calf-hair, whence it is wound on bobbins. The wire is said not to suffer in quality by the manipulation it undergoes.

**ON FILES.**—A writer for the *Polytechnic Review* notes the following points: In using a new file, the pressure employed at first should be comparatively light, until the very sharp edges of the teeth have been removed; after which, stronger pressure and deeper cut may be made without injury to the teeth. But if the teeth have, hard usage put upon them while their edges are keen and penetrating, they are likely to take hold more strongly and become broken off at the root. A few careless strokes may damage a new file as to take away half the "life" of the first cutting. The skins of castings are not only "chilled," and hence harder than the interior, but are often glazed with a vitreous surface, in which, also, gritty particles are imbedded. No new file should be used on such surfaces, nor on welds where borax or vitreous fluxes have been used, nor on oxidized surfaces; but a worn file should be used to attack such work, which will scarcely harm it. For filing steel, grades coarser than second are apt to be too "hoggy;" steel cannot be ripped off like brass or iron, and the same cut of file should not be used on steel and on iron, any more than on brass and iron, or horn and iron. In buying files, see that full weight is given, especially where recutting is to be done. While a light-weight file will hardly stand one recutting, one that is full weight will bear recutting two or three times.

**AMERICAN TOOLS.**—In his review of the late World's Fair at Philadelphia, Francis A. Walker says: "In edge tools the supremacy of the United States is so complete, that, as is well known, foreign producers have been largely driven to imitate the general style of our goods, and even at copy trademarks. 'In the manufacture of steel,' says Prof. Reuleaux, 'the United States takes unquestionably the first place to the Exhibition; in single branches of this manufacture their priority is even absolute. The axes, hatchets, files, the tools for forestry, plantations and gardening, and the like, are presented in such variety and beauty as compels us to stand and gaze with wonderment. The saws, both plain and circular, with all the fine, yea, refined singularities possible in this department, together with steel tools for the mason, the molder, the statuary and the machinist, are of the first order in merit. I will also add, that the larger sawing machines, the cross-saws, the block-saws, and the like, have reached a height of development from which we are still far distant.'"

**AGRICULTURAL IMPLEMENTS IN RUSSIA.**—The United States Consul at Odessa recently wrote to the State Department at Washington that "implements of agriculture might come in great quantities to this country if our manufacturers would make an effort in that direction, and adapt their implements for the use of the peasantry of this country. The principal thing to be done is to make them exceedingly firm and strong. American reapers and mowers are now the favorites above all others, and have a large sale. In other machinery the English manufacturers have the field, and I have seen no article of their machinery that excels the American, unless expensiveness may be deemed an excellence. I am persuaded that there is a fine field here for the American threshing machine."

**A NOISE EXTINGUISHER.**—Everybody that travels has experienced the annoyance of having his ears deafened on board a steamboat by the roar of escaping steam. Sometimes accidents have occurred during the racket of "blowing off" simply because the captain cannot make his orders heard, and everything has to be done in dumb show while the disturbance lasts. Happily, says the *American Manufacturer*, an invention called the spiral exhaust nozzle is destined to choke off the noise. It operates by breaking the waves of sound, the escaping steam being surrounded with a wire helix, and obliged to pass between the wires. These nozzles are in use on steamers running between Philadelphia and England.

**PNEUMATIC HOIST.**—M. Blanchet, the manager of the Epinau collieries (Saone-et-Loire), has sunk a shaft 656 yards deep and placed in it a tube formed of iron plates, in which travels a tightly packed piston capable of carrying on its upper surface a load of 10 tons. When loaded, a vacuum is made above it, and it is driven up, bringing the drawing cage with it. The fuel tips are removed and replaced by empty ones, and atmospheric pressure is applied to effect the descent of the piston. The latter is kept in place by vertical guides.

**TRAIN TELEGRAPH.**—A patent electric system, says the *Railroad Gazette*, has lately been introduced on the trains of the Philadelphia, Wilmington and Baltimore railroad. This system supersedes the present bell and cord arrangement to communicate with the engineer, and also gives a continuous automatic alarm on the locomotive whenever any portion of the train becomes accidentally detached. The arrangement is also applied to freight trains.

**NOVEL PLATE WORK.**—On the 30th of June an exhibition of novelties in connection with the metal trades, more especially plate working, was opened in the Schutzenham at Leipzig. Amongst objects exhibited were a fountain throwing a jet three feet high by means of solidly made clockwork; decorated tinsplate for various purposes, capable of resisting strong heats; wire-inserters, etc. Improved tools and implements of various sorts were also exhibited.

## SCIENTIFIC PROGRESS.

## Moons for Mars.

An astronomical discovery, which is ranked among the greatest of this century, has been made at the observatory at Washington, by means of the new instrument which is called the "great telescope." Accounts which came to hand enable us to compile the following interesting narrative: About 11 o'clock, on Thursday night, August 16th, Professor Hall noticed a very small star following Mars a few seconds, and made an estimate of its distance from the planet. Two hours later he looked again, and was surprised to find that the star seemed to be following the planet. As the distance had not increased, while the planet was moving away at the rate of 15 seconds an hour, he therefore made a careful series of measures, which showed that the satellite was 80 seconds from the planet. An hour later it was still there, but Mr. Hall made no further observation, hardly crediting the great discovery he had made.

On Friday morning he showed his observations to Professor Newcomb, who was so confident that the object must be a satellite, that he calculated roughly the time of its revolution, which he fixed at one day, eight hours, or a little less. This showed that the object would pass behind the planet some time during the following night, and that if not seen in early evening, it would reappear before daylight in the morning. In the evening it was invisible, but reappeared, true to the prediction, about one o'clock in the morning with a companion satellite. Professor Hall had now so little doubt of the reality of the object, that he made the discovery known to Admiral Rogers, the superintendent. It was still thought best to wait for another look before formally announcing the discovery, especially as Professor Newcomb's calculation showed that it would be on the opposite side of the planet on Saturday evening. Hardly was the telescope turned on Mars, when the satellite was seen, and its position determined by several of the astronomers.

Scientific authorities in Washington regard this as ranking among the greatest telescopic discoveries of the century; the only two which exceed it being that of the asteroid group in 1801, and of the planet Neptune in 1846. Professor Hall, the fortunate discoverer of the satellite, has been attached to the observatory since 1862. When Professor Newcomb resigned the charge of the great telescope, in 1875, he succeeded to it. He is an able and learned mathematician, and an unostentatious and conscientious observer. Professor Hall, who has kept continuous watch at the instrument for a week, furnishes the following statement:

"The first satellite of Mars was discovered at the naval observatory, in Washington, on the night of August 16th. It was first seen at 42 minutes past 11 o'clock. It has been observed on the nights of the 16th, 17th and 18th of August. The time of the revolution of this satellite about Mars is about 30 hours. Its greatest apparent distance from the center of Mars is 80 seconds of arc. I think I saw another satellite on Saturday morning about four o'clock, but of the existence of this second satellite I am not absolutely certain. I believe, however, that there are two, and I expect to be able to determine this to-night, as I commence observations again about midnight. The satellite, in its appearance, is a faint object of about the size of a star of the 13th or 14th magnitude, and it was possible to discover it only by putting Mars, which is now exceedingly bright, out of the field of the telescope, so as to get rid of the brilliant light of that planet."

The distance of the first satellite from the planet is between 14,000 and 15,000 miles, which is less than that of any other known satellite from its primary, and only about one-sixteenth the distance of the moon from the earth. The inner one, as to the existence of which the astronomers are not yet absolutely certain, is still closer. The diameter of the new satellite is very small, probably not more than 50 or 100 miles.

The following dispatch announces officially the discovery of the new satellites:

WASHINGTON, August 19th.—Two satellites of Mars have been discovered by Hall, at Washington. First, elongation west, August 18th, 11 hours, Washington time; distance 80 seconds; period, 30 hours. Distance of second, 50 seconds. JOSEPH HENRY.

**MISSING ISLANDS.**—The news of the vanishing of the Barker islands and their inhabitants from the northwestern coast of Australia, says *Iren*, will puzzle those geologists who assume that because a place lies out of a known line of volcanic action, it must therefore be safe. Whatever may be supposed to be the case now, Western Australia betrays many traces of former volcanic action, and the disappearance of the Barker islands can hardly be regarded as a greater marvel than that of Stromboli. It is an unfortunate accident for Captain Fisher—the Tasmanian capitalist, who purchased from the West Australian government the right to remove guano from the islands in question. In April last, he dispatched three vessels with laborers and appliances for shipping the guano; but, after cruising about for some time in latitude 14° S. longitude 125° E., they could not make out the islands, which ought to have been there. How and when the islands disappeared is at present unknown, and it is not very probable that any evidence will be added to that now before the public.

## Venus' Slippers.

Mr. F. Buckland, in *Land and Water*, says: "These slippers are far more beautiful than anything ever yet turned out in the workshop of a London or Parisian ladies' bootmaker. They are found floating far out at sea in the Mediterranean, on the French coast. Each slipper is about an inch and a half in length, and half an inch in the widest part. They are of a lovely glass-like consistence, and in a certain light resplendent like jelly-fish. They are the shape of a handsome shoe: the edge of the shoe projects in a very ornamental dentated margin, and the toe part is highly ornamental, as if with embroidery insertion. Mr. M. Latham says: 'It is a kind of jelly-fish; I have had considerable difficulty in finding out its real nature. At last I ascertained that it is one of the pteropoda, or wing-footed molluscs.' The Rev. J. Wnead writes: 'These are so-called from the fin-like lobes that project from the sides, and are evidently analogous to the similar organs in some of the sea snails. These appendages are used almost like wings, the creature flapping its way vigorously through the water, just as a butterfly urges its devious course through the air. They are found in the hotter seas, swimming boldly in vast multitudes amid the wide waters, and one species (*Clio beredalis*) has long been celebrated as furnishing the huge Greenland whale with the greater part of its subsistence. The scientific name of it is *cymbulia*, so called on account of its being so like a boat.' We read: 'Cuvier describes the *cymbulia* as having a cartilaginous or gelatinous envelope in the form of a boat or slipper, beset with points in longitudinal rows; and the animal as possessing two great wings, which are at once branchiae and fins, and between them on the open side, a third smaller lobe, which is three-pointed. The mouth, provided with two small tentacula, is placed between the wings towards the shut side of the cell, and above are two small eyes. The transparency of the texture permits the internal organs to be distinguished with great facility. The shell is cartilaginous, translucent, oblong in the form of a slipper, and entirely covered with a delicate and scarcely visible membrane.'"

"These slippers of the Marine Venus are so beautiful in form and structure that I propose, if possible, to have a model of them cut in crystal. In the form of ear-rings they would make very pretty ornaments, as showing *chaussure* of Cinderella of the ocean."

## Astronomical Work in Washington.

The editor of the *American Manufacturer* has made "an excursion" to Washington and took these notes: "We visited the Naval Observatory, and saw there several objects of interest. Among them was the equatorial telescope, said to be the largest in the world. It is 32 feet 8 inches in length, with an object glass of 26 inches in diameter, clear aperture. It was made by Alvin Clark, of Cambridge, Mass., in 1873.

"We saw there also the standard astronomical clock which keeps the time for the Observatory, and from which Washington mean time is telegraphed every day to all parts of the country. To keep this clock from sudden changes of temperature it is inclosed by a thick wall of masonry, and to keep the wall free from moisture a coal fire is constantly kept burning in the room.

"The records of the transit of Venus are being worked up by the officers in charge of the Observatory. Few have any idea of the immense amount of labor expended in this direction. It includes microscopic measurement of a large number of photographs of the transit, which have to be made with expensive and complicated apparatus especially designed for the purpose. Most of this apparatus is entirely novel, and is the invention of Prof. William Harkness, who was one of the chief officers of the transit expedition. The chronometers used by vessels of the navy are all tested and their rate of error recorded at this Observatory. We saw a large number of these instruments, which were made by the principal manufacturers of this country and Europe, and were told those made by a certain firm in New York are superior in every respect to those of foreign manufacture."

**NORRENSKJOLD'S NEXT EXPEDITION.**—For Professor Nordenskjöld's expedition, which is to set out from Gothenburg, in Sweden, in June, 1878, a vessel has already been chartered for 150,000 Swedish crowns (about \$25,000.) King Oscar has contributed 50,000 crowns from his personal revenue, but the burden of the expense will be borne by the friend and patron of Nordenskjöld, a merchant of Gothenburg named Dickson. The route of the expedition will be from its starting point to the North Cape, thence eastwardly through the Polar Sea to and through Behring's Strait; thence along the eastern and southern coasts of Asia, through the Red Sea, the Suez Canal, and the Mediterranean Sea to the Atlantic Ocean, and return home in the autumn of 1879. This looks like a voyage of general discovery, and if the North Pole should be struck, all the better. He can hang the Swedish flag upon it.

**SPECTRUM OF ELECTRIC LIGHT.**—M. P. Desains finds that the spectra of electric light are very similar to those of the solar rays. They are less extensive, particularly on the side of the violet; but the curves of intensity exhibit but slight differences in the region of greatest heat.



Table of Highest and Lowest Sales in S. F. Stock Exchange.

Name of Company.	Week Ending Aug. 16.	Week Ending Aug. 23.	Week Ending Aug. 30.	Week Ending Sept. 6.
Alta	11 10	11 10	11 10	11 10
Andes	2.65 21	2.40 23	3 24	5 41
Baltimore Con.	250 10	100 10	250 10	700 10
Belcher	41 10	41 10	41 10	41 10
Best & Belcher	16 15	15 15	15 15	15 15
Bullion	71 60	71 60	71 60	71 60
California	3.85 3.80	3.70 3.40	4 30	4 30
Chollar	28 25	27 25	27 25	27 25
Chollar-Potosi	36 29	32 30	36 29	36 29
Confidence	5 41	5 41	5 41	5 41
Con Imperial	850 750	800 750	800 750	800 750
Con Virginia	29 29	29 29	29 29	29 29
Crown Point	4.10 4.65	4.40 31	3.95 3.55	5 3.85
Coso Con	100 100	100 100	100 100	100 100
Dayton	350 350	350 350	350 350	350 350
Eureka Con	330 330	330 330	330 330	330 330
Exchequer	61 61	61 61	61 61	61 61
Geddes & Bertrand	250 200	250 200	250 200	250 200
Gen Thomas	150 150	150 150	150 150	150 150
Grand Prize	150 150	150 150	150 150	150 150
Golden Chollar	800 300	800 300	800 300	800 300
Gould & Curry	9 81	9 81	9 81	9 81
Hale & Norcross	4.80 4.30	4.40 4.00	4.00 3.50	5 5.50
Julia	1.35 75	1 70	1.10 1.15	1.15 1.65
Justice	91 81	91 81	91 81	91 81
Justus	6 51	6 51	6 51	6 51
Kentuck	31 31	31 31	31 31	31 31
Knickerbocker	41 41	41 41	41 41	41 41
Kossuth	250 150	250 150	250 150	250 150
Lady Bryan	1 90	1 90	1 90	1 90
Lady Wash	500 500	500 500	500 500	500 500
Leopard	1.35 1.50	2 1.70	3.30 1.35	1.80 1.70
Leviathan	450 350	350 300	450 300	300 300
Leeds	21 21	2.25 1.30	1.10 1.50	1.50 1.75
Madison	800 700	800 700	800 700	800 700
Manhattan	131 101	101 101	101 101	101 101
Mansfield	950 700	750 450	1 900	900 850
Meadow Valley	104 91	91 91	91 91	91 91
Mexican	300 250	350 250	300 300	300 300
Northern Belle	181 17	17 17	17 17	17 17
Northern Con	750 750	750 750	750 750	750 750
Ophir	18 15	15 15	15 15	15 15
Overman	221 19	234 19	27 24	29 24
Pacific	115 110	115 110	115 110	115 110
Phil Sheridan	500 500	1 850	1.45 1.10	1.15 1.10
Pioneer	100 100	100 100	100 100	100 100
Prospect	300 300	400 250	400 250	400 250
Raymond & Ely	14 131	131 17	17 17	17 17
Rock Island	61 61	61 61	61 61	61 61
Sage	28 27	40 30	42 37	48 40
Seg Belcher	41 3.80	41 31	41 31	4.65 4.30
Sierra Nevada	2.30 1.30	2.1 2.1	2 4	4 3.30
Silver Hill	1 10	1 10	1 10	1 10
South Chollar	500 500	500 500	500 500	500 500
Succor	500 500	500 500	500 500	500 500
Trojan	500 500	500 500	500 500	500 500
Union Con	54 41	4.95 41	54 4.80	6 51
Utah	1 10	1 10	1 10	1 10
Wells Fargo	500 500	500 500	500 500	500 500
Woodville	9 81	9.57 91	101 92	12 100
Yellow Jacket	9 81	9.57 91	101 92	12 100

Sales at S. F. Stock Exchange.

FRIDAY, A. M., Aug. 31.	90 Baltimore Con.	100 315 Best & Belcher	110 700 Bullion	70 700 California	100 700 Chollar	100 700 Chollar-Potosi	100 700 Confidence	100 700 Con Imperial	100 700 Con Virginia	100 700 Crown Point	100 700 Coso Con	100 700 Dayton	100 700 Eureka Con	100 700 Exchequer	100 700 Geddes & Bertrand	100 700 Gen Thomas	100 700 Grand Prize	100 700 Golden Chollar	100 700 Gould & Curry	100 700 Hale & Norcross	100 700 Julia	100 700 Justice	100 700 Justus	100 700 Kentuck	100 700 Knickerbocker	100 700 Kossuth	100 700 Lady Bryan	100 700 Lady Wash	100 700 Leopard	100 700 Leviathan	100 700 Leeds	100 700 Madison	100 700 Manhattan	100 700 Mansfield	100 700 Meadow Valley	100 700 Mexican	100 700 Northern Belle	100 700 Northern Con	100 700 Ophir	100 700 Overman	100 700 Pacific	100 700 Phil Sheridan	100 700 Pioneer	100 700 Prospect	100 700 Raymond & Ely	100 700 Rock Island	100 700 Sage	100 700 Seg Belcher	100 700 Sierra Nevada	100 700 Silver Hill	100 700 South Chollar	100 700 Succor	100 700 Trojan	100 700 Union Con	100 700 Utah	100 700 Wells Fargo	100 700 Woodville	100 700 Yellow Jacket
2230 Alta	41 30	315 Best & Belcher	700 Bullion	700 California	700 Chollar	700 Chollar-Potosi	700 Confidence	700 Con Imperial	700 Con Virginia	700 Crown Point	700 Coso Con	700 Dayton	700 Eureka Con	700 Exchequer	700 Geddes & Bertrand	700 Gen Thomas	700 Grand Prize	700 Golden Chollar	700 Gould & Curry	700 Hale & Norcross	700 Julia	700 Justice	700 Justus	700 Kentuck	700 Knickerbocker	700 Kossuth	700 Lady Bryan	700 Lady Wash	700 Leopard	700 Leviathan	700 Leeds	700 Madison	700 Manhattan	700 Mansfield	700 Meadow Valley	700 Mexican	700 Northern Belle	700 Northern Con	700 Ophir	700 Overman	700 Pacific	700 Phil Sheridan	700 Pioneer	700 Prospect	700 Raymond & Ely	700 Rock Island	700 Sage	700 Seg Belcher	700 Sierra Nevada	700 Silver Hill	700 South Chollar	700 Succor	700 Trojan	700 Union Con	700 Utah	700 Wells Fargo	700 Woodville	700 Yellow Jacket

100 Dardanelles	125 Ophir	171 171	171 171
550 Endowment	100 Overman	24 25	24 25
350 Eureka Con	20 Sierra Nevada	41 40	41 40
50 Empire Id.	1170 Sierra Nevada	41 40	41 40
970 Exchequer	935 Succor	1 80	1 80
350 Golden Chollar	400 Succor	1 80	1 80
1130 Grand Prize	730 Silver Hill	30 30	30 30
350 Grand Central	30 Union Con	1 21	1 21
1205 Gila	925 Union Con	5 06	5 06
510 Hussey	270 Yellow Jacket	10 11	10 11
65 Hale & Nor.	270 Yellow Jacket	10 11	10 11
70 Jackson	270 Yellow Jacket	10 11	10 11
120 Joe Scates	270 Yellow Jacket	10 11	10 11
3385 Justice	169 171	11 12	11 12
100 K K Con	100 Andes	750 800	750 800
1150 Kossuth	100 Benton	250	250
1300 Leopold	100 Benton	250	250
50 Leeds	100 Benton	250	250
1425 Leviathan	100 Benton	250	250
760 Lady Wash	100 Benton	250	250
760 Modoc	100 Benton	250	250
1800 Minetta Bell	100 Benton	250	250
25 Manhattan	100 Benton	250	250
200 Meadow Valley	100 Benton	250	250
900 New York	100 Benton	250	250
400 Northern Belle	100 Benton	250	250
100 North Con Vir.	100 Benton	250	250
145 Occidental	100 Benton	250	250
180 Ophir	100 Benton	250	250
300 Phenix	100 Benton	250	250
750 Panther	100 Benton	250	250
300 Prospect	100 Benton	250	250
300 Peytona	100 Benton	250	250
235 Rock Island	100 Benton	250	250
110 Rye Patch	100 Benton	250	250
180 Raymond & Ely	100 Benton	250	250
200 Stepote	100 Benton	250	250
100 Treadwell	100 Benton	250	250
720 South Justice	100 Benton	250	250
150 Solid Silver	100 Benton	250	250
210 Seg Belcher	100 Benton	250	250
500 Sierra Nevada	100 Benton	250	250
400 Trojan	100 Benton	250	250
175 Utah	100 Benton	250	250
100 Yellow Jacket	100 Benton	250	250
TUESDAY, A. M., SEP. 6.	100 Benton	250	250
100 Andes	100 Benton	250	250
100 Benton	100 Benton	250	250
100 Bullion	100 Benton	250	250
445 Best & Belcher	100 Benton	250	250
600 Bullion	100 Benton	250	250
335 California	100 Benton	250	250
180 Chollar	100 Benton	250	250
615 Con Virginia	100 Benton	250	250
3605 Con Imperial	100 Benton	250	250
775 Crown Point	100 Benton	250	250
2775 Caledonia	100 Benton	250	250
240 Gould & Curry	100 Benton	250	250
885 Exchequer	100 Benton	250	250
1765 Hale & Nor.	100 Benton	250	250
8000 Justice	100 Benton	250	250
1600 Julia	100 Benton	250	250
55 Kentuck	100 Benton	250	250
200 Mexican	100 Benton	250	250

SALES OF LAST WEEK AND THIS COMPARED

THURSDAY, A. M., AUG. 30.	THURSDAY, A. M., SEP. 6.
145 Alpha	25 Alpha
880 Alta	50 Andes
50 Andes	865 Alta
200 Bullion	320 Bullion
305 Belcher	880 Best & Bel.
225 Best & Belcher	1220 Belcher
510 Con Imperial	220 Benton
50 Crown Point	740 Benton
120 Chollar	1035 California
675 Con Virginia	32 95 Con Imperial
1280 California	360 Caledonia
100 Confidence	290 Chollar
550 Caledonia	320 Chollar
300 Exchequer	100 Dardanelles
720 Gould & Curry	250 Dayton
1065 Hale & Nor.	300 Exchequer
4555 Justice	830 Gould & Curry
200 Joe Scates	100 Hale & Nor.
800 Julia	101 100 Justice
70 Kentuck	100 Julia
100 Lady Wash	80 Kentuck
450 Leviathan	100 Lady Wash
95 Mexican	100 Leviathan
1150 New York	305 Mexican
885 Overman	37 250 New York
510 Ophir	161 171 North Con Vir.
300 Occidental	11 370 Overman
300 Peytona	11 370 Overman
70 Seg Belcher	43 440 Peytona
365 Sierra Nevada	4 40 1.30 St. Justice
400 Savage	107 101 Silver Hill
1315 Silver Hill	107 101 Silver Hill
100 South Justice	100 South Justice
55 Trojan	85 8900 South Justice
70 Utah	101 111 Utah
280 Union Con	101 111 Union Con
250 Yellow Jacket	101 111 Yellow Jacket

AFTERNOON SESSION.	AFTERNOON SESSION.
2600 Argentina	1 95 101 85
240 Alta	31 24 20
190 Belmont	850
170 Belcher	100
50 Best & Belcher	17
100 Chollar	35
140 Con Virginia	32 32 32
480 California	29 22 24
1800 De Fries	30
10 Eureka Con	39
880 El Dorado South	30 31
200 Empire Id.	60
150 Exchequer	60
890 Gould & Curry	57
70 Hussey	50 60 60
400 Hale & Nor.	4 30
320 Jackson	140 141
50 K K Con	41
300 Leopold	20
220 Leeds	1 50 85
400 Meadow Valley	80 61
10 Manhattan	100
1120 Modoc	50 55 55
100 Mansfield	100
1300 Minetta Bell	100
100 Northern Belle	17 17 17
5400 Navajo	100
125 Ophir	161 161
315 Overman	100
600 Panther	100
400 Phoenix	10
100 Raymond & Ely	16 16 16
300 Stepote	31

Pacific Board—Latest Sales.

THURSDAY, A. M., SEP. 6.	AFTERNOON SESSION.
105 Alpha	1175 Argentina
505 Belcher	70 Belcher
280 Best & Belcher	17 17 17
320 Bullion	320 Bullion
250 Caledonia	4 45 4 15
150 California	28 28 28
1300 Con Imperial	31 31 31
355 Con Virginia	32 32 32
350 Crown Point	4 4 4
300 Dayton	55 57 57
290 Gould & Curry	91 91 91
50 Herald	21
350 Hale & Nor.	1 20 11
385 Julia	1 20 11
1620 Justice	11 11 11
50 Lady Wash	1520 Justice
110 Leviathan	1520 Justice
135 Mexican	1520 Justice
20 New York	1520 Justice
310 Ophir	1520 Justice
60 Overman	26 26 26
290 Sierra Nevada	42 40 40
150 Silver Hill	3 40 3 40
350 Trojan	800
150 Trenton	800
350 Union Con	800
50 Yellow Jacket	101 101 101

## MINING SHAREHOLDERS' DIRECTORY.

[Compiled every Thursday from Advertisements in the Mining and Scientific Press and other S. F. Journals.]

## ASSESSMENTS—STOCKS ON THE LISTS OF THE BOARDS.

COMPANY.	LOCATION.	No.	AMT. LEVIED.	DELINQ'T.	SALE.	SECRETARY.	PLACE OF BUSINESS.	
American Flag M & M Co	Pioche	10	25	June 23	Aug 18	G R Spinye	310 Pine st	
Alps M Co	Pioche	11	50	July 20	Sept 12	O D Squire	Cor Cal & Monty st	
Alpha Con M Co	Washoe	8	100	Aug 17	Oct 13	W Willis	309 Montgomery st	
Best & Belcher M Co	Washoe	11	100	Aug 8	Sept 13	W Willis	309 Montgomery st	
Baltimore Con M Co	Washoe	16	50	Aug 4	Sept 6	C A Sankey	331 Montgomery st	
Dayton M Co	Washoe	8	50	July 4	Aug 23	W E Dean	419 California st	
DeFrees M & M Co	Washoe	2	25	Aug 3	Sept 5	E C Convis	330 Pine st	
Gould & Curry M Co	Washoe	31	100	Aug 31	Oct 5	A K Durbin	309 Montgomery st	
Hale & Norcross S M Co	Washoe	55	50	July 31	Sept 5	J F Lightner	309 Montgomery st	
Independence M Co	Washoe	1	15	Sept 1	Oct 3	R H Brown	426 California st	
Julia Con M Co	Washoe	4	100	Aug 11	Sept 17	A Noel	419 California st	
Justice M Co	Washoe	21	150	Aug 17	Sept 22	J S Kennedy	419 California st	
Kossuth M Co	Washoe	8	15	Aug 31	Oct 4	E F Stone	419 California st	
Lady Wash M Co	Washoe	55	50	July 26	Sept 17	D Wilder	325 Montgomery st	
Modoc Con M Co	Washoe	2	50	Aug 4	Sept 7	E F Dickins	419 California st	
Monitor Belmont M Co	Washoe	1	50	Aug 22	Sept 10	C B Minor	309 Montgomery st	
Mexican M Co	Washoe	4	50	Aug 22	Sept 10	C B McCoy	419 California st	
Martin White M Co	Washoe	2	20	Sept 1	Oct 9	Nov 8	J J Scoville	309 Montgomery st
New Coso M Co	Washoe	5	50	Aug 24	Sept 29	Oct 24	D F Verdinal	409 California st
South Barcelona M Co	Washoe	3	50	July 24	Aug 23	Sept 17	J F Moore	229 Sansome st
Sierra Nevada M Co	Washoe	29	100	July 30	Sept 29	Oct 29	W W Stetson	309 Montgomery st
Sierra Nevada M Co	Washoe	50	50	Aug 9	Sept 11	Oct 2	W W Stetson	309 Montgomery st
Yellow Jacket M Co	Washoe	26	100	July 16	Aug 17	Sept 20	P Ennis	Gold Hill



# MINING SUMMARY.

The following is mostly condensed from journals published in the interior, in proximity to the mines mentioned.

## California.

### AMADOR.

**Estimate.**—Amador Ledger, Sept. 1: The Eclipse mining company will soon resume work. The hoisting works are now being put up. The engine and everything is on the ground, and five carpenters are at work. Soon we will have another steam whistle in the heart of Amador City. The stockholders are all elated.

**Ministry.**—Matters have advanced another stage in connection with this mine. The former made arrangements some weeks ago to have a quantity of the rock crushed at the Onida mill, and actually hauled about 50 tons there for that purpose. The batteries were started on the rock last week when the United States Marshal appeared on the scene and put a stop to the milling of the ore. This action effectively disposes of the idea of the speedy starting up of the mine. Everything is now held to a standstill, awaiting the decision of the courts on suits pending.

**Mills.**—Most of the mills throughout the county are now idle for want of water. The Plumbly, Glover, Hunker Hill and Original Amador are all shut down. The Amador Co. is running only 20 stamps. The Keystone is still running to its full capacity, having the water to the water, but it is probable that it will have to hang up its stamps for a season, or else take to steam.

**Improvement of the Canal.**—The Amador Canal Company intend to remove the pipe which now crosses Sutter creek about two miles above town, and which carries water over to the Glover, Hunker Hill, Original Amador and the mines of that vicinity. The new pipe will run through the town of Sutter Creek, within 150 feet of the Wildman mine, by the Maloney and Lincoln, and supplying the Tallman and Keystone. The pipe will be 200 feet lower at one end than the other, thus giving a good pressure. Another pipe will be laid across Amador creek to the ditch of the Original Amador, supplying the Glover, Plumbly and other mines with the essential liquid. These improvements will do away with 17 miles of branch ditches, and thus prevent evaporation and seepage incident to open ditches, besides giving an increase of pressure. Men will be put to work on this undertaking forthwith.

**Shut Down.**—Amador Dispatch, Sept. 1: We learn that the Amador mine at Sutter Creek was compelled to stop running, temporarily, last Tuesday evening, owing to a lack of water. The stoppage, however, will only be for a short time, as they are preparing to run by steam, in case a fresh supply of water cannot be had.

### BUTTE.

**Good Luck.**—Orville Mercury, Sept. 1: We are much pleased to learn of the good luck that has attended the labors of the miners on the middle fork of Feather river. A party at work in the river near the Mountain house have struck it rich, and are taking out a large quantity of ore. Should the mine hold out until late they will have enough to make every one of them a good stake. Other parties are doing well and making money fast.

**Mining to Some Purpose.**—Mrs. J. T. Rhoads, of Magalla, in company with her husband and two other gentlemen, took out for the Union claims, west branch Feather river, \$125 per day for 12 days in succession, the nugget weighed over seven ounces, and the end is not yet.

### CALAVERAS.

**Strike in the San Bruno.**—Calaveras Chronicle, Sept. 1: We are pleased to learn that a large body of rich ore has been struck in the San Bruno mine at Mosquito, upon which work was recently resumed. The ore body has been uncovered in the 325-ft east level, the vein showing fully three feet wide. The new proprietors of the mine are very much elated with their prospects, and are pushing development vigorously.

### INYO.

**In Operation.**—Inyo Independent, Sept. 1: The Beauty furnace, of the Union Consolidated works at Cerro Gordo, is in operation, running on silver ore from the San Felipe ledge, and iron and low-grade lead ore as flux from the old Union mine, which mine was not affected by the fire that destroyed the hoisting works.

**Cerro Gordo.**—By announcement, it will be noted that the Beauty furnace will receive gold and silver ore for reduction. The new Superintendent and the foreman of the mill are men of unquestioned ability and thoroughness in their calling, and now it behooves our mine owners to get out ore and realize on it—or at least ascertain its worth by actual working.

**Estimate.**—Superintendent Rickards has closed down the Beauty works, and for the present will confine operations to work at the bottom of the mine, intending to sink 100 feet further before opening new levels. The ore at the bottom is of a better quality than elsewhere in the mine; besides, we understand, the upper levels have been pretty well worked out, necessitating the opening of new ground.

**Rex Montis.**—The Rex Montis mill question has been settled by the purchase from Messrs. Harris & Binn (who hold under Sheriff's deed) of the entire property of the Silver Sprout company, including the mill, the Silver Sprout and the Lamb mines, with other ledges and the ranch, the purchase price of the whole being only \$8,360—probably the lowest sum ever paid for so valuable a mining property. The Rex Montis men have improved the mill above to the extent of \$5,000, which amount would have been lost had the purchase not been made. Under Superintendent Hutchings, he having authority from the company to go ahead in full force, the Rex Montis will soon rank second to none of the "outside" mines. As to quality of the ore, the hullion shipment of the season from the little mill best speaks for itself.

**Travay.**—Coso Mining News, Sept. 1: The winze is now 20 feet in depth, and from this point the miners have started north and south on the body of ore discovered 10 days ago. The ore recently discovered below the vein, carrying gold and silver, proves to be rich in lead as well as silver, which facilitates smelting operations, that will be commenced at no distant day. Mr. Rodda is adding to his working force as fast as men can be added to advantage.

**Coso Co.**—The prospects of the Coso Co., as we learn from the Superintendent, are now more and more flattering than ever. A large deposit of fine caliche ore is being opened up in the lower workings of the mine, which, so far, proves superior in quality to any heretofore found. The extent of the discovery cannot yet be determined with accuracy, but the prospect is certainly favorable for a large deposit, and, being at the lowest point yet reached, is very encouraging for the future permanency of the mine.

**Monoc.**—From reliable parties in from Lookout, and who are in a position to know whereof they speak, we learn that the Modoc furnaces will again be started on the 10 inst. On account of the extreme dry season, their water supply has been short, but they find, as the fall season approaches, that their springs are increasing in volume.

### MONTEREY.

**Quicksilver.**—Salinas Inter, Aug. 30: The Salinas quicksilver company have invited an assessment of six cents per share. It is supposed by the officers that this is all the assessments that will be required to open the mine. The lower tunnel is in 320 feet, and 30 feet more will complete it so that it will be directly under the shaft. It is then necessary to raise 60 feet to connect with the shaft sunk from above, when the company will commence stopping out and shipping ore at once. The tunnel is just tapping the wall rock of the ledge, and everybody is full of jubilation over the prospects of the mine.

### NEVADA.

**An Extensive Slide.**—Nevada Transcript, Sept. 1: A few days ago an extensive slide took place in the Blue Bank, Oriental, NIX and Boston gravel claims to Washoe's Flat. The Blue Bank was almost ready to disintegrate and it was estimated that from \$200,000 to \$300,000 would have been the result of their work; but the cave came and buried it all up, besides the boxes, pipes, etc., and it is said the cave is so extensive it will take over one year to reach the boxes that contain the gold. The bank where the cave occurred is about 400 feet deep, and the slide extends about one-half of a mile in length, over the Blue Bank, Oriental, NIX and about that much of the Boston claims. The Blue Bank is owned by Jay Reed, Wm. Rankin, Sam. Mills and Wm. Price; the Oriental by Frank Henry & Co., the NIX by Marks Zellerbach, and the Boston by Marks & Magarity. The damage done cannot be estimated by dollars and cents at the present time. The Oriental and NIX were not being worked at the time the slide occurred. These are all the particulars we could obtain.

**The Missouri Mine.**—Nevada Transcript, Sept. 1: We were shown, yesterday, a bar of gold weighing 31 ounces, which was the result of six tons of rock taken out of the ledge known as the Independence. This quartz was taken out of one of the upper levels. Where most of the work is being done under the ledge is about 15 inches thick and is being done in the Independence. It is thought that the ledge will pay from \$60 to \$70 per ton. Everything is going along nicely in all parts of the mine, and the prospects of the company were never better than at present.

### PLACER.

**Stranger than Fiction.**—Placer Argonaut, At the Rising Sun mine, near Colfax, a most extraordinary accident occurred the other day. As four or five miners were being lowered into the shaft, and when yet but a short distance down, one of them, a Cornishman, named John Tate, put out his foot against the side of the shaft. While the bucket was rapidly descending. A moment later his companion were horror-stricken to find that he had suddenly disappeared in the darkness. When they reached the bottom they looked around for his mangled remains, but no trace of him was to be found. This was mysterious. They could not believe their senses. A feeling of superstition came upon them. There seemed to be no possible solution of the strange disappearance, because the body of the miner had not been seen, or, very nearly so, on the return of the skip to the surface. The body was found, hanging head downward, his feet firmly caught in the crevice of one of the timbers. His head was seized as with a giant's grasp, and there the poor fellow hung by one leg, with nothing but space and darkness intervening between him and the bottom, 500 feet below. He was unhurt. This is what may properly be called a miraculous escape.

### SIERRA.

**Golden Star.**—Mountain Messenger, Sept. 1: It is reported that the Golden Star tunnel is into gravel. They had only a short distance to run about a week ago. Placers.—Pipelay has been struck in the Ploocene shaft, at a depth of 180 feet. This has been penetrated some 40 feet at the time we go to press, where a stratum of clay, quartz pebbles and wood has been struck.

**Completed.**—The boys have finished their contract for sinking for piers for the bridge, getting down to bedrock in every instance. Two of the hents are in place and the framework of the bridge is advancing. It will be a substantial structure.

**Silver.**—We are advised of the existence of and been shown rock from a ledge not more than three miles from this place, which assays \$22.40 in silver and \$15 in gold. We should like to see work begin towards developing that ledge.

**Developing.**—The Virginia company are about to commence sinking a shaft on their claim on the ridge above Forest City, somewhere in the neighborhood of Milton, as near as we can locate it. They will put on heavy machinery and go down rapidly.

## Nevada.

### WASHOE DISTRICT.

**Cos. Virginia.**—Gold Hill News, Sept. 5: Daily yield, 500 tons of ore. The mills are all steadily running, and the billion yield for August is amply sufficient to insure the payment of the regular dividend of \$2 per share, on the 5th. The ore stops on the 1,200-ft level are opening out nicely and are yielding rich ore. The ore on the 1,300, 1,400 and 1,500-ft levels are also looking finely and are yielding rich ore. The ore stops extending southward on the 1,500-ft level are showing a decided improvement. On the 1,650-ft level the ore stops are being gradually extended to the southward, the ore being very uniform in character and of a very rich quality. A broach drift has been started south from the main west drift from the C. & C. shaft, on the 1,550-ft level, to strike the south end of the ore. The ore stops are being extended southward on the 1,550-ft level, the north drift on the east side of the ore vein is slowly advancing, the heat in the face being fearful. On the same level, the west drift from the C. & C. shaft and the east drift from the bottom of the double winze have completed a connection, showing 81 feet of good ore from the center of the winze to the east side of the ore vein. A drift south from the bottom of the winze on the 1,700-ft level is being pushed vigorously ahead to complete a connection with the north drift, from the Gould & Curry, on the same level. The face of this drift is in rich ore.

**California.**—Daily yield, 800 tons of ore, keeping the mills all steadily running. The billion yield for the month of August is fully up to the usual high standard and insures the payment of the regular dividend of \$2 per share. The largest amount of the 1,550-ft station of the Consolidated shaft is completed, ready for the extraction of ore from that portion of the mine again. Cross-cut No. 4, below the 1,500-ft level, is being pushed vigorously forward. The ore stops on the 1,550-ft level are showing splendidly. The ore stops on the 1,600-ft level are yielding rich ore, which is growing richer as the sill floors are extended to the southward. Forty feet south of No. 3 winze, a cross-cut is being run in the ore body to the eastward, proving the ore beyond doubt to be of a very rich character. The air connection between winze No. 4 and winze No. 5, on the 1,600-ft level, has been completed, and greatly assists ventilation. The ore stops on the 1,650-ft level are yielding splendid ore, and are being gradually extended to the southward, yielding No. 3 winze below the 1,650-ft level is making good progress. The bottom still being in rich ore. Taken together, the ore prospects of the mine were certainly never better. If equal, in the past, to the showing that is now exhibited.

**Julia.**—The east drift from the east winze, on the 1,800-ft level, has penetrated into a much softer and more favorable formation of clay, porphyry and quartz, with the encouragement of the water reaching the east ledge. A cross-cut—No. 8—is now being run to the westward from the main south drift, on the 1,800-ft level, the last 15 feet of which has been in quartz and ore of a softer and better character than any before found in the mine. Along with this ore a strong flow of very hot water was struck. The water is scalding hot, having a temperature of 200° F. and is increasing in volume. The water is said to be increasing in amount.

**Alta.**—The west drift, on the 1,650-ft level, has been driven 150 feet to the westward, at which point the east clay wall of the ledge, carrying large stringers of quartz and ore, was encountered, and a flow of water so strong that it was deemed advisable to not tap the ledge until the justice drift, on the opposite side, 300 feet further to the southward, should draw the water, when both mines would take it together and make the job of draining the ledge much lighter than it would be for one mine to do it alone.

**Homesstead.**—Sinking the main working shaft is steadily progressing, continuing in a mixture of porphyry and clay, carrying a large amount of iron ore, and a low temperature, indicating increasing value as greater depth is attained. The flow of water is light.

**Utah.**—Sinking the incline winze below the 1,150-ft level is going vigorously ahead, the rock in the bottom still being quite hard.

**California.**—The west crosscut, on the 1,600-ft level, has reached the west wall of the vein, and shows it to be of great width and of a fine and encouraging character. A following it to the northward.

**Justice.**—The east cross-drift at the 1,150-ft level is advancing in what is considered to be the outcrop of the main ore channel. Strata and bunches of good ore have been met with, and an increase of water, but the winze sunk from the level above shows but little drainage as yet. The daily ore yield of the mine is 350 tons, and the various ore stops on the 500 up to the 500-ft level are looking and yielding fine ore as usual.

**Union Co.**—The east drift on the 1,300-ft level during the past week struck an entirely new character of ground, the hard rock in the face changing to a soft porphyry and clay, carrying streaks of fine looking quartz. This discovery is entirely to the eastward of anything of value previously developed in the mine, and when taken together with the fact that the water has ever been struck in the old west prospecting drifts, and that there is no flow for the first time a strong appearance of water in the face, leads to the belief that all the former prospecting in the mine has been done too far to the westward to be successful.

**Sierra Nevada.**—The south drift from the upraise on the 1,400-ft level is rapidly advancing, the face in good working ground. The drift is being pushed forward with interest in the mine, as it is intended to connect with the north drift on the same level from the Mexican for ventilation, and no cross-cutting of much consequence will be attempted until the drifts are connected.

**Yellow Jacket.**—Main east drift at the 2,200-ft level is in good face in porphyry with seams of quartz carrying ore. The work is being pushed forward with interest in good sinking ground, and water still on the decrease.

**Imperial.**—The main cross-drift, east at the 1,700-ft level is pushing ahead in good looking vein matter, and the combination drift at the 2,000-ft level, running north from the Imperial, is showing very encouraging indications in its face.

**Union.**—Both the north and south drifts on the 1,000-ft level are being pushed vigorously ahead in a favorable ground. At noon to-day a cross-cut was started directly east from the 1,000-ft station to cut and prospect the ore vein. This is a very important drift, as it will in all probability reach the vein in a very short time, and will penetrate it almost in the very heart of the mine.

**San Jose.**—The new working shaft is now down about 125 feet, altogether in very promising quartz, just within the east wall, which it has been following for the last 50 or 70 feet.

**Mexican.**—The north drift on the 1,455-ft level, running to connect with the south drift from the Sierra Nevada, is making the best of headway, and will without doubt be able to make the connection by the end of the present week. The work is now as near each other that they can distinctly hear each other. The face of the north drift on the 1,600-ft level is in much softer and more favorable ground, with increasing ore prospects. Sinking the joint incline winze on the Diphir line, below the 1,700-ft level, is making good progress.

**Imperial Co.**—A drift has been started to the eastward on the northern boundary, and a station is now being cut out to start a joint winze on the Alpha line, which will be sunk to the same level as the bottom of the south winze, and then connected with that winze by a lateral drift.

**Overman.**—The east drift on the 1,300-ft level is steadily advancing, the face in a very good character of quartz. A drift has been started southward on the ore vein on the 1,400-ft level to connect with the California.

**Gould & Curry.**—Sinking the main incline is going rapidly ahead, the bottom in hard blasting rock. The south drift from the bottom of the winze, on the 1,600-ft level, is steadily advancing, to connect with the bottom of the Savage combination winze on the south line.

**Belcher.**—Sinking the main incline is going steadily forward, the flow of water in the bottom still being quite strong.

**Leviathan.**—Face of south drift at 600-ft level all in loose grade ore, with occasional streaks of porphyry; constant improvement in the face of the drift advances.

**Citadel-Potosi.**—Daily yield, 30 tons of ore, the assay value of which is \$23 per ton. The east drift on the 1,800-ft level is steadily advancing, the face in good running ground. This drift is very hot.

**Savona.**—Considerable trouble has been experienced during the past week with the pump rods, which has prevented the water from rising in the shaft a number of feet, which is not yet any lower than it was a week ago.

**Silver Hills.**—The water in the shaft appears to be slowly decreasing of its own accord, being now several feet below the highest point that it reached after the breakage of the pumps.

**Crown Point.**—The south drift on the 2,000-ft level is making the best of progress, and will connect with the bottom of the double combination drift shaft some time during the coming week.

**Sutton Tunnel.**—Very good advancement continues to be made in the header, the face being in soft ledge porphyry, clay and quartz. No increase of water.

### BRISTOL DISTRICT.

**Royal City.**—Ploche Record, Sept. 1: A mining excitement, which, for the size of Ploche, is of considerable magnitude, is being created about the Jackrabbit mine and its adjoining claims in the Bristol mining district. Hardly a day passes but what some parties visit that mine, and parties start out in that neighborhood to prospect for its supposed concealed wealth. Quite a number are now out there; some having mining locations on which they are working, whilst others are prospecting for same. Wagons go out loaded with provisions, tools and other necessities for a mining camp; and daily, on Wednesday last, Oscar Westcott was employed by some parties to go out there, select a town site, survey the same, and to do the work necessary to hold it. This was done; the work of surveying being completed on Wednesday, the map being completed and recorded on Thursday. The place is now known as "Royal City."

**Mayflower Mine.**—The Mayflower mine, at Bristol district, near the H. H. mine, which has been started on a visit to on Thursday last, is turning out ore rapidly, the ore being of a high grade and supposed to be good milling ore. The best is being sacked. Work is progressing rapidly under the charge of Frank Wheeler, and everything looks well for the prospects of the mine.

**Nor Wagoner Yet.**—Curiosity will have to remain unsatisfied for a few days longer in regard to the character of the Jackrabbit mine, as the working of the 10 tons at the American Flag mine is not completed to date.

### ELY DISTRICT.

**Refuge to Pay.**—Ploche Record, Sept. 1: The billion tax on the proceeds of the mines for the quarter ending June 30th has not been paid, and the Attorney General, according to the orders of the District Attorney, according to the rate of taxation levied on property within the fire limits—that is, at \$4 upon every \$100. This addition the mining companies claim to be unjust, and they accordingly refuse to pay; they, however, tendering the amount that they claim is right, according to the way the tax has previously been collected on the mine. The result is that there is every show for a long lawsuit, without the County Commissioners take the matter under consideration at their meeting next Monday, which we understand they intend doing.

**Alta S. M. Co.**—Considerable ore has been raised during the week. Trains are running three times per week from the N. C. R. R. to the mine at Lookout. The vein of good ore still continues in the drift running west from the winze between the 9th and 10th levels. The mill at Rollinville is running steadily and doing good work.

**Ramona & Ely.**—The lower level is looking favorably and the work progressing well. On the 6th level there is a nice improvement in the ore stops, working in a vein of high grade ore, and the water is being raised to the work crushing ore a week in advance of the time that was intended, owing to the ore dumps being crowded with ore, over 800 tons being on hand.

**Culimino.**—Billy Miller and some other miners are

making arrangements to start work on the Huhn & Hunt lately known as the Nevada mine.

## Arizona.

**Tyndall District.**—Cor. Arizona Citizen, Aug. 24: Deer Lodge is a beautiful little camp situated on a creek flowing south from a peak known as the Bailey and Hopkins peaks, and about four miles north of the Arizona coast. There are a number of valuable holes already discovered in the district. Of the mines, the Josephine and various ore stops on the 500 up to the 500-ft level are the largest; these have a dip of 50 feet deep and 10 to 15 feet wide; cropping 20 feet high. The ore dumps of ore on the dump. In the former working on this ledge the ore was packed to a distance and is supposed to have been worked at the Tumacacori church. The shaft will tap the lead 160 feet; there are several thousand tons of ore in sight. Next comes the Hidalgo and Talach mines. These are very promising locations, the ledge being from three to four feet in width, carrying carbonate ore. They comes the Magdalena, with work performed, showing a vein of two feet of chloride ore, with four or five tons on the dump; owned by Messrs. Roddick, Luck and Britton. Messrs. Kimberley and Luck own some of the ledge, with work done on them. One of these, the Kelly, is a pretty little ledge, 18 or 20 inches of chloride ore. Another is called the Morrill. On this ledge are down 12 feet, showing two feet of carbonate ore. Then comes the Kiedly, down 14 feet in hard green and yellow ore, containing carbonate and horn blende; three tons on the dump. Next comes the Joy of it, the Ledilla, having four or five tons on the dump. The vein is three feet through and no waste ore, carbonate, which would smelt into lead, owned by the Kiedly company, Roddick, Luck, Britton & Britton. Messrs. Sam Adams and Roddick have a new location, the croppings of which look well and are of a copper-stained ore. Mr. Adams owns three or four locations, but they are not sufficiently prospected to tell how they are at work. There are many locations here not yet opened, and you can't tell what they may be inside. The old mines, Cacho and Tumacacori, have been closed out and show milling ore of a chloride nature.

**Discoveries.**—Arizona Miner, Aug. 21: During the last 10 days, many very valuable mines have been discovered by the prospectors in the various districts. Ore is being taken from the Perry mine, Hassanyama district, in the south of the county, which is really a marvelous discovery, thousands of dollars worth of ore, the richest of the ore is being sacked, preparatory to shipping to San Francisco for sale. A tunnel is being run into the side of the mountain, which will strike the lead 150 feet under ground, when the owners will realize that they have a bonanza of untold value.

**Lyons Creek.**—Over in the Lyons Creek district, the Zalida company continue to work their mine with the usual good results, taking out rich chloride ore from the bottom of the 70-ft shaft that assays several hundred dollars per ton.

**Big Run.**—Big Run several mines are being worked and are yielding their owners handsome profits.

**Pack.**—The Pack mine, in Pack district, keeps a host of men at work, and their Aztlán mill is steadily pounding away and turning out about \$10,000 of chloride ore per month. Their new 10-stamp mill will be on the ground, and men are employed hauling brick, hauling lumber out, etc., to be used in its erection; and, within 60 days from date, they will be putting forth to the gaze of the faithful Arizona, at the least calculation, \$2,000 per day from this, one of the most wonderful mines of the present period.

**Bradshaw.**—In Bradshaw and Bradshaw the outlook is bright, and a great yield of ore is looked for from these districts as soon as sufficient rain falls to supply the water wherewith to run the quartz mills now standing idle for the want of that element.

**Globe.**—In the Globe, ore continues to be found equally rich as those found in the Richardson, at White Pine, a few years since. Much of it will assay \$20,000 to the ton.

**Pima County.**—Pima county is booming, and the interest taken in her by capitalists from all sections, who are willing and anxious to invest in the rich silver deposits that abound in great numbers within her borders, is evidence conclusive, to the unprejudiced, that Southern Arizona is unsurpassed in mineral worth. The same can be said of Mojave county, with her famous McCrackin, Hupe, Keystone, Hackberry and the many other excellent mining property scattered here and there. In every nook and corner from the line of Yavapai to the Colorado, quartz mills are going up like magic, and within 60 days the shipments from that county alone will surprise the outside world.

## Montana.

**Silver.**—Lute's Miner, Aug. 29: Last Sunday the owners of the Little Appleton Spar shipped to Corbino, from that claim, 30 tons of first-class silver ore, that will yield about 300 ounces of silver per ton.

**During the last two weeks, W. A. Clark has had 500 sticks of mining timber delivered at the different mines in which he has been interested. Upon several of these claims that have now been idle for a long time, work will soon be resumed.**

**Copper.**—We have lately been shown some very fine specimens of argentiferous copper ore, taken from a hole recently discovered in the Silver Lake district. This hole is not very far from the celebrated Silver Moss lode. The ore shows a trace of antimony in addition to the silver and copper, and is free milling to such an extent that it can be worked by mill process within 167 of its value.

**Silver Lake.**—The Monroe mill, of Dewey's Flat, as we learn from the Superintendent, Mr. Logan, has lately been employed upon ore from the Mammoth lode, belonging to Brannigan & Patton, and with more satisfactory results than ever obtained before in the Vipond district. Tom Manning, who went some time ago from Butte, to take several of the men of the Mammoth lode, has returned with the most gratifying success in the use of the new Parvane pan, and is working the ore of the Vipond district to so close an approach to their assay value that all parties interested are more than satisfied with the results.

**Parvane Parvane.**—The inventor of the new celebrated Parvane pan, we learn that Noah Armstrong, of Butte, is working the Mammoth lode, has completed his new smelter and will put it in operation this week. The working capacity of the new furnace is 50 tons per day, and, as soon as it gets fairly at work, there will be a steady demand from Glendale for the silver and copper ore of Butte. The silver ore needed are the base manganese ores that cannot be worked here at the mills, and for them, Mr. Armstrong will pay at the mine a higher percentage of their assay value than the mills can afford to pay for free milling ore.

**Losses of the Dexter.**—Last week the final clean-up, preparatory to the sale announced to-morrow, was made in the Dexter mill, and 13 tons of billion, valued altogether at \$8,500, cleaned up. According to the Trustee's sale, published in another column, the mill, together with several mining claims, was sold for \$10,000 to-morrow, but we just learn that Mr. Parlan has applied to the Court for a stay of proceedings, and that the issue between himself and W. A. Clark will likely go into court and be adjudicated upon before any disposition can be made of the mill or mines. Pending the decision of the suit, the mill, we suppose, will stand idle. This we consider a great misfortune.

## Oregon.

**Monterey.**—Grant County Times, Aug. 31: Development have greatly strengthened the confidence we have ever reposed in the Monterey, and the prospects to-day are more flattering than at any time since the ledge was struck. The progress of the tunnel is now watched with exciting interest. Five very promising ledges having been cut thus far, while the most promising ledges still remain uncut. In passing through these ledges, no foot wall was found until the last one was tapped, showing conclusively that this vast amount of ledge and ledge matter is the same ledge, and when the several ledges are struck, a six-foot ledge will be the result. The discoveries made on the surface have resulted very satisfactorily, and have demonstrated the fact that the entire bill is one vast chimney of fabulously rich ore.



## Idaho Mines.

The Idaho *World* speaks as follows of some of the quartz mines of Boise county:

In 1867, Wm. Lent and others put up a 25-stamp mill at Quartzburg, for the purpose of working a ledge that, in a short time, proved itself to be a balk, and work was suspended. The mill was afterwards purchased for an insignificant sum, \$15,000, by Mootry, Lynch, Coughanour, Molony and Johnson, and work commenced on the Gold Hill mine, situated in close proximity to the mill. This was in 1869. Mr. Lynch sold out the year following, and gradually the entire stock became the property of David Coughanour, Thomas Mootry and William Coughanour, and, by strict business management and economical working, has never failed to be a dividend-paying institution. The mill has run continuously for eight years, with the exception, if correctly informed, of a few months last year, when a level was being sunk, never failing to pay handsomely, and making the owners independent. Until within the past two years, the ore has been conveyed from the mine to the mill through a tunnel; but recently a shaft has been sunk 100 feet below water level, and hoisting works erected, by which means the ore is brought to the surface, when it is run into the mill on cars and dumped in front of the batteries. About 50 tons are thus brought to the surface and worked every twenty-four hours, although the vein is no more than 10 or 12 inches wide, and only about 50 hands employed in extracting and reducing, the whole cost of which does not exceed six dollars per ton, the ore containing free gold, and being easily extracted without the use of powder. There are no useless men under pay about the works; no superintendents dashing about, wearing kid gloves and riding yellow horses; no supernumeraries of any kind. Wm. Coughanour, with the assistance of a foreman in the mine, superintends the entire business, and everything runs like clock-work. How long this mine may continue to yield up its treasures no one can tell. The bottom has never been seen, and there are no indications of the beginning of the end.

## The Eisler Mine

Is exactly like the Gold Hill, being a continuation of the same lead, being the same size, with the same kind of ore and the same bedrock. It has not as yet got into successful working shape, but will not fail to be a fine paying property.

In years gone by, large sums of money have been made in a small way in extremely rich mines at Summit Flat, distant from Quartzburg ten miles, and from Idaho City fourteen miles, making a kind of triangle. They are distant from the Sub Rosa and other rich mines, located in the Gambrinus district, about six miles. The owners of these veins worked a little ore convenient to the surface, but when machinery was required to go down and work it systematically they ceased operations, and now a fine field is lying open at Summit Flat for the investment of a little capital. There is a quartz belt of eight or ten miles in width, commencing at Summit Flat and running south through the Gambrinus district towards More creek, unexcelled in rich croppings; with some of the veins, as shown in our last week's report, true fissures, and doubtless continuous in depth. We predict that Boise county will take and maintain a high stand as a quartz district in a very short time. Our mines paying from the surface enables the companies of small means to operate; and they are so easy of access that the cost of placing machinery is light, compared with other districts. Several men who have been struggling in poverty for years have, within the last six weeks, acquired property by discovery that large sums of money would be required to buy. This is also the case with the discoverers of the Sub Rosa, only the discovery was made two years ago.

## Artificial Gems.

Young and old, of all ranks, have admired the brilliant transparency of the diamond, the purple of the ruby, the blue of the sapphire, the green of the emerald, the orange tint of the hyacinth, the transparent blood-red of the garnet, the variegated tints of the agate and porphyry, and the delicate subdued whiteness of the pearl; and we can scarcely wonder that a desire for preparing imitative copies of them should spring up.

When glass contains certain metallic particles, says the *British Trade Journal*, they usually impart a tint of color to it, varying according to the nature and quantity of the metal; in the plate and crown-glass manufactures, metallic oxides are always used to counteract the coloring effect of other ingredients, by tending to impart a different tint, the combined effect of the two producing colorless transparency. Now as this property of metallic particles must have been known from the first epoch of the glass manufacture, it required but another step to make it available for the production of imitative gems.

About the year 1665 Andrew Cassius, physician to the Bishop of Loubeck, devised a mode of imitating rubies in a more perfect manner than had been before known. This was by dissolving gold in a mixture of muriatic and nitric acids, called *aqua regia*, or royal water (from the circumstance of it being the only solvent then known for gold), and then precipitating it by a solution of tin, by which a purple-colored powder was procured. This powder, which, from the inventor, has been called "purple precipitate

of Cassius," was then incorporated with transparent glass to form the imitative rubies. At a later period John Kunkel improved this manufacture, and made for the Elector of Cologne a cup of ruby-glass, weighing 24 pounds, a full inch in thickness, and of an equally beautiful color throughout.

At all times a brilliant red has been more difficult to impart to glass than most other colors. The greens, blues, etc., require less care in the preparation; and consequently the appearance of the greater number of gems has been imitated with considerable success. It is impossible for us in this place to detail the various processes by which this has been effected; for such details have enabled M. Fontanieu, to fill a large octavo volume. We can only glance at the most prominent facts.

What we popularly call paste is technically known as *strass*; this is also the French word for the same substance (from M. Strass, its reputed inventor). Paste, then, is a material with which diamonds are imitated, and by mixing up with it metallic oxides of various kinds, colors in great variety are imparted to the paste, by which it serves as a representative of the various colored gems.

Strass is prepared, according to the method of M. Donault, who has attained great proficiency in this art, from silica, potash, borax, and oxide of lead, and sometimes arsenic. Rock crystal and flint consist almost entirely of silica; but as flint generally contains a little iron, the silica obtained from it is liable to have a tinge of color which is detrimental to the fidelity of the imitation; rock crystal is therefore employed.

The crucible in which the materials are melted claims particular attention, since, if the substance of which it is formed contains metallic particles, color would be imparted to the strass. Hard porcelain and Hessian clay are the best materials for this purpose. When the crucibles are supplied with the proper quantity of ingredients, they are placed in a porcelain furnace, where they are exposed to a steady heat for 24 hours, and then allowed to cool very slowly, so that a kind of annealing goes on. By this means is produced a strass, or paste, which, after passing through the hands of the lapidary, who gives it the form necessary for "setting," presents us with an imitation of the diamond.

Having once produced the strass which imitates diamond, all other gems may be imitated, by mixing with strass various metallic oxides and other substances, according to the color it is desired to produce. Herein is manifested great diversity of opinions, different experimenters advocating different modes of procedure and different ingredients. One experimenter recommends the following ingredients: To imitate topaz, add glass of antimony, precipitate of Cassius, and oxide of iron, to the white strass; for ruby, add oxide of manganese; for emerald, oxide of copper, iron, and chromium, and acetate of copper; for sapphire, oxide of cobalt; for amethyst, oxides of manganese and cobalt, and precipitate of Cassius; for heryl, glass of antimony and oxide of cobalt; for garnet, glass of antimony, precipitate of Cassius and oxide of manganese.

M. Donault has given directions somewhat different from the above; but we need not particularize them, as it would carry us into too minute details. We may, however, mention that he produces the imitative rubies by a particular treatment of the composition employed for topaz. This composition is 1,000 parts of strass to 40 of glass of antimony and one of purple of Cassius; at a certain stage of its preparation it affords an opaque mass, translucent at the edges, and affording thin laminae of a red color. A part of this opaque topaz matter, added to eight parts of strass melted in a Hessian crucible, and left 30 hours in a potter's furnace, affords a beautiful yellowish crystal. If this crystal be remelted by means of a blowpipe, it produces a strass nearly equal to the finest Oriental rubies.

The art of producing imitative gems, ingenious as it is, is necessarily a confined one; for as soon as faithful copies of certain jewels are obtained, the object of the art is attained. The object is to deceive the eye; for as M. Dumas remarks, "the most perfect description of strass, if it imitate no particular and identical gem, has no value, because it deceives nobody."

**SANTA CLARA PETROLEUM MINE.**—The shareholders in the Santa Clara Petroleum Company transferred their stock to a party of Eastern capitalists, represented by an agent in San Francisco, last Wednesday. The transfer was made reluctantly, and only because certain of the shareholders were unprepared financially, we suppose, to work the mine to a successful termination. Of late days not much work has been done, and the mine has been developed to but a very small extent, although there is every indication of paying oil being in large quantities. The new company, under the same corporate name, backed by a large amount of capital, will prosecute the work on a more extensive scale, and will soon have the mine well developed. The new company has purchased all of the land adjoining the mine which could be purchased, and will soon erect their works. The mine is situated about 15 miles from Santa Clara in what is known as Moody's gulch. The existence of petroleum in that locality has been no secret; on the contrary, it has been known for years, and an attempt was once made to mine for it. The work of doing so was hadly conducted and the enterprise given up as a failure. This second attempt, however, has every indication at present of being successful. —*San Jose Mercury.*

## Prospects in Arizona.

The *Arizona Citizen* says: The average indications are in favor of a prosperous future for most parts of Arizona. We listen with great care to the many reports as to what is going on and what advancement is being made, and there seems no doubt but the future of mining, stock-growing and tillage of the soil in Arizona is encouraging. This is a year of excessive drouth all over the Pacific coast, and Southern California especially is suffering for want of rain. The late crops in the Salt and Gila valleys, we are informed, will be partial failures, except in the Upper Gila in this county, where the corn crop will be quite abundant. But barley and wheat crops have been very good and large. The fruit crop in Salt and Gila valleys is above average in quantity and of excellent quality. Here the July hail storm destroyed much of the fruit, yet there will be considerable of fair quality. Sheep and cattle continue in good order. Our meat markets are supplied with excellent beef and mutton, fattened on grass alone. Here and there water regarded as permanent has disappeared, yet we have not heard of a single case of suffering or death among the sheep and cattle for want of water, and stockmen are preparing to enlarge their herds by importations from California and Texas. Our season for rain will not be past for a month yet. Pima county can stand a severe drouth as well as any, and, perhaps, with less damage than any other. As to mining prospects, what is said is surely encouraging. We have some reason to believe that the Pima mining company will ere long go to crushing their millions of tons of pay ore and perhaps further develop the mine. Our latest advices from San Francisco operators with regard to the mines in the Santa Rita and surrounding mountains are all that we ought to expect. As soon as the weather cools off on the Colorado desert, we are assured that Californians interested in mines to the southward will come and give personal attention to them. While money is and may continue for some time scarce, the accumulation of valuable property is quite rapid. All in all, the future, so far as can be foretold or foreseen, is rather cheerful than otherwise.

Then the indications are that the railway will soon be extended east from Yuma from 150 to 200 miles. This will tend to the speedy improvement of the Gila valley, and attract the bulk of the shipping of the Territory to the valley. It will enable many mine owners to either ship or reduce ores at home, which cannot now be banded without loss. It is almost a business necessity for the Southern Pacific to do what Chief Engineer Gray says will be done—extend the road eastward without delay.

## The Future of Montana.

At no period in the history of this Territory have the prospects of continued and increasing prosperity been more encouraging than they are to-day. The mines are paying quite as well as in past years, and there is no reason to believe that this will not continue for some years hence. Of course the placers will not continue to be remunerative for all time to come, but it should be borne in mind by those contemplating coming to Montana to settle that she has other sources than her placer mines from which to gather wealth. Her silver quartz lodes are now in a fair way of development, there being not less than 1,000 men engaged in the extraction and reduction of this class of ores, and the ore reduced must average 150 tons. There is now good reason to believe that the number of men employed and the reduction capacity of mills, concentrators and furnaces combined will not be fully doubled before the close of the year. All developments made give unmistakable evidence that the lodes are rich and permanent, and the hullion product only governed by the capacity of the reduction works. In addition to the amount above stated as being reduced daily, several thousand tons of the richest have been shipped out of the Territory for reduction. The gold quartz mines have also been worked with unusual vigor this year. The number of men employed in extracting gold ore is estimated to be about 1,000, and nearly 400 tons are daily mined and reduced. The reduction facilities promise to be greatly increased before the close of the present season. The mines never before looked so encouraging as they do now. The copper mines are no small source of Montana's wealth. There have been many valuable lodes discovered, and several have been systematically developed. Several hundred tons of ore that contained upwards of 50% of copper have been shipped to Newark, New Jersey, for reduction. This branch of mining has been seriously retarded in consequence of the entire absence of reduction works, save one small concentrator. It is almost certain that this state of affairs will be changed soon. There is no better opening for capitalists anywhere than is here presented, if capital be used in the erection of reduction works and the development of copper lodes. —*Helena Independent.*

**PHOSPHIDE OF COPPER.**—M. Lidot has presented to the Paris Academy of Sciences a flask containing phosphide of copper so perfectly crystallized that the crystallographer would possibly be able to determine its form. M. Lidot presumes that this substance enters into the composition of certain bronzes, which thus acquire a remarkable sonority, besides becoming very hard and very brittle.

## The Precious Metals of the Land of Midian.

On the eastern coast of the Gulf of Akaha runs the ancient land of Midian, and for long years past that country has been supposed to teem with mineral wealth. The Khedive, whose viceregal rule extends to Midian, had long a desire to put rumor to the test, and asked Captain Burton to make a visit of inspection. The party, which included a secretary and an able mining engineer, M. George Marie, left Suez on the 21st of March last, and proceeded by way of Moilah to Eynounah hay, at the entrance of the Wady, or valley of Eynounah, on the eastern side of the gulf. These wadies are curious. The coast is divided from the interior by a range of granite and porphyry mountains, running about parallel with the sea; but water has worn its way as usual, and these gorges, each with its mountain torrent, occur at frequent intervals. They are barren, rocky places, with no possibility of much culture, and yet they all bear signs of abundant population in times gone by.

Large towns, built not of mud, as Arab towns so often are, but of solid masonry, such as the Romans always used, roads cut in the rock, aqueducts five miles long, remains of massive fortresses, artificial lakes—all these signs of wealth and numbers, are reported by Captain Burton. According to him, the reasons of it all is not far to seek. The rock is full of mineral wealth. Gold and silver they found, and the former seems to exist in quantity sufficient to repay the labor of acquisition. Quartz and chlorites occur with gold in them, just as they are found in the gold districts of South America. The party tested both the rock, by crushing, and the sands of the stream, by sifting, and each with good result. Tin and antimony they also discovered, and they had evidence of the existence of turquoise mines. Each ruined town had its mining works; dams for washing the sand and crushed rock were frequently seen; scorie lie about near ancient furnaces; in short, the traces are numerous of a busy mining population, in a country which seems to be full of mineral wealth. From Makna, or Mugna, the capital of the land of Midian, up to Akaha, at the head of the gulf, Captain Burton reports the country as auriferous, and he believes the district southwards as far as Gehel Hassani—a mountain well known to geographers—to possess the same character. He even goes so far as to say that he has brought back to life an ancient civilization. —*London Times.*

## Glassware.

The fine display of glassware made by the San Francisco factory, in the pavilion, is almost entirely hidden from view, and shielded from harm, by the silk exhibit. One would have supposed that such a pyramid of glass could not have been easily hidden, but such is the case. It is a creditable showing of the home manufactured article, and comprises a full stock of the common kinds of green and dark ware. Among the many different articles they display, we notice a huge champagne bottle holding 100 pints; carboys of unknown capacity, glass globes, for ornament, fruit jars of four kinds, soda and other small bottles, demijohns of the most approved kind, which, as every one knows, are Newman's covered ones, which can't be broken by fair usage. This most ingenious contrivance has in a great measure revolutionized the retail trade in liquors. Formerly five gallon kegs were resorted to when sending small amounts of liquors or chemicals into the country. Now Newman's patent tulle covered and boxed demijohn is almost entirely used for this purpose. They are first covered with tulle grass, over which is plaited the usual wicker covering, and then for country travel put in a box with screw top, so that they go safely over the roughest road, and return again to be filled any number of times. The San Francisco Glass Works Company is a combination of two former companies, and their works are situated near Fourth and Townsend streets, and are well worth a visit.

Immediately adjoining the above exhibit is that of John Taylor & Co., druggists' glassware and fittings. They show a fine assortment of such goods, including gold scales of the most approved pattern, retorts, hullion moulds, assayer's furnaces, fancy glassware, carboys of different shapes, porcelain ware for different uses, the whole surmounted by a statue of Atlas sustaining upon his shoulders a large glass globe. At the end of the fair we presume the old fellow, with all the goods now in his charge, will retire to some easier job, at Nos. 512 and 514 Washington street, where Messrs. Taylor & Co. hold forth.

**AWARD OF THE LAVOISIER MEDAL.**—The Lavoisier medal of the Societe d'Encouragement pour l'Industrie Nationale has just been given to an Englishman, Mr. Walter Weldon, F.R.S.E. In presenting it, M. Dumas congratulated Mr. Weldon upon having cheapened every sheet of paper and every yard of calico made in the world; and at the same meeting at which the presentation took place Prof. Lamy stated that, whereas at the date of the introduction of Mr. Weldon's invention, seven or eight years ago, the total bleaching powder made in the world was only about 55,000 tons per annum, it is now over 150,000 tons per annum; and that of this vast quantity fully 90% is made by the Weldon process.



## Hunter District.

The new district discovered not long since north of the railroad, in Eureka county, Nev., is looking well. The town of Carlin has just started a journal, called the *Carlin Pioneer*, in the first issue of which we find the following regarding Hunter district. This district is situated about 12 miles nearly north west of Carlin. It has been but recently discovered, and is rich and extensive the mines will prove to be is still a matter of conjecture. The statement of developments, which we give below, gives a fine promise, and we earnestly wish that the brightest hopes of the owners may be realized. No class of persons deserve more of the sympathies of mankind than the prospector. In this, the richest of quartz-mining regions, one out of 50, perhaps, is successful; the other 49 pass away in time, unhonored and unknown. Yet the prosperity of the country is the product of these self-sacrificing, unyielding prospectors, who are too poor to be independent and too proud to be menial.

Carlin has another show for life and prosperity in Hunter district. Let her see to it that the mines be not allowed to fall for want of a little help to the prospector. The indications are, however, that the mines are now, or soon will be, beyond the need of assistance. The following is a brief statement of the present condition of some of the most promising locations. The Broad Horn is the name given to the discovery location. A shaft has been sunk to the depth of 30 feet, showing a vein 18 inches wide, the average assay being \$100 per ton. Three other locations have been made upon the same lead, which can be traced by croppings the entire distance. The general direction of the leads of the district is north and south. The Short Horn lead lies north of the discovery. In the shaft, 12 feet deep, the quartz is from two to three feet wide, and assays from \$90 to \$300. The Derby lead is south of the discovery; it shows a larger vein than either of the other locations. The owners of these claims are J. Gilligan, C. Staffenburg, D. Washeim, H. Deacon, J. McClure, J. E. G. Hunter, T. Veats, C. Rockhart, C. Crumpecker, J. Hollister, A. Bruce, T. Holmes, E. Cousins and L. G. Smith. We have been unable to get the particulars of the fourth location, but understand that the indications are fully as encouraging as upon either of the others. Two locations, the Oriental and Atlantic, have been made upon a vein parallel to that above described. The Oriental yielded three tons of \$60 rock from a shaft eight feet deep. The owners are T. Holmes, D. Washeim, C. Washeim, J. Gilligan and C. Staffenburg. As indicated by the number of owners, some small sales have been made; one, upon the Short Horn, for \$6 per foot. We understand that the owners of the Broad Horn have let a contract to sink 25 feet more. This will make their shaft 55 feet deep.

## The Prospector.

Yesterday, we saw on Main street a specimen of the old-time prospector. These restless pioneers are seldom to be seen in the old mining camps nowadays, but are usually found upon the verge of civilization, pushing outward to unprospected fields, in search of that fortune which they feel certain is in store for them, but which almost always eludes them. In the early days of California mining, prospectors would make their annual migrations from the northern to the southern mines, or *vice versa*; or, after spending the winter in working the ravines and flats, would seek the rivers in the summer, to turn the stream in order to work the deposits, which too often were more illusory than real in value. The prospector of the olden time usually had a little burro, upon which was loaded the blankets, camp and mining utensils, and provisions, while the prospector would follow on "Shank's mare," carrying rifle or revolver, and was always cheery and hopeful, because he was young and full of animal spirits, and the virgin soil had untold wealth waiting the labor and search of the gold seeker. There is a fascination in prospecting for deposits or leads containing the precious metals that the uninitiated cannot realize; and with some men it becomes the passion of their lives. They have no home or abiding place—they desire none. The good find of to-day will pall upon their senses on to-morrow. There is something better beyond, and they go in its search—and thus they continue to move on, until age, decrepitude, disease and death may overtake them; but within them hope is ever young. But to come back to our item: Our old friend, yesterday, did not look as if he had found the golden fleece. His step had lost the elasticity of youth; his hair and whiskers were turning gray in the shadow of declining years, but the bronzed cheek and strong muscles told of an out-door life of labor, and the independent air of his movements proclaimed him one of the pioneers. He had the usual prospector's outfit—roll of blankets, pick, shovel and pan, but they were not strapped on the back of a "Washoe Canary"—grass was too short with the old man for that—but he had them loaded on a light wheelbarrow, which was an easy-going vehicle, and not liable to streaks of stubbornness or frights from the strange sights or sounds of civilization. The old man passed down Main street and on beyond. He is looking for the rich lead which has escaped him since the "days of '49."—*Grass Valley Union*.

## Useful Information.

## What a Gas Manufacturer Ought to Read.

At the last meeting of the British Association of Gas Manufacturers, the President, Robert Paulson Spence, in his annual address, spoke as follows: "I cannot shrink from the expression of my opinion that a gas manager should aspire to a scientific knowledge of the material structure of the globe, its place and its path in the universe, and attain to such a degree of familiarity with the sciences of chemistry, geology and astronomy as may enable him to bring to the practical and every-day labors of his life the aid of those great principles which are involved in, and underlie, the solution of the problems which naturally arise, and require his skill in the determination of the right direction to be given in his dealings with the various forces of nature, intimately connected, as they undoubtedly are, with his common avocations, demanding the economical adaptation of the means to the end to be accomplished."

And these being the primary objects of his professional life, I would suggest that he would do well to have on his book-shelves Kingley's "Town Geology," an elementary and popular work, treating of the soil of the field, the pebbles in the street, the stones in the wall, the coal in the fire, the lime in the mortar, and the slates on the roof; the works of Hugh Miller, entitled "My Schools and Schoolmasters," "The Testimony of the Rocks," and the "Old Red Sandstone;" Faraday's popular lectures "On the Various Forces of Nature," and the "Chemical History of a Candle;" Notes of a Course of Nine Lectures on Light," delivered at the Royal Institute in 1829; and "Six Lectures on Light," delivered in America, in 1872-3, by Tyndall; and Herschel's "Outlines of Astronomy."

These several works contain almost inexhaustible and measureless mines of intellectual wealth, calculated to raise the conceptions, expand the intellect, and enlarge the resources of the gas manager, place him above the common level of his fellow-townsmen, and make his power felt by them, to a degree and in a way in which it could not otherwise be, quite as much to their advantage as his; and thus it would, in his own experience, prove the truth of Lord Bacon's aphorism, that "knowledge is power," always assuming that the knowledge is accompanied by the twin virtues, discretion and courtesy. The chemist, the geologist and the astronomer each furnish all-important aids to the gas manufacturer and manager, enabling him to trace effects to causes, and to make the best use of materials.

**DELICATE MACHINERY.**—The mechanical machinery at the Bank of England, says the *British Trade Journal*, is marvelously perfect. It may not be generally known that the London bankers, when the standard weight of the working sovereigns is suspected, send these into the Bank of England, the suspected coins being kept separate and weighed one by one, and the light sovereigns charged to the debit of the banking house that delivered them. To large concerns like Glyn's, the London and Westminster, Barclay's, and the National Provincial, the debit account for light gold foots up at the end of the year to a large amount. The deficiency in the weight is caused by abrasion in the constant wear and rubbing of the gold currency. The machines which weigh the sovereigns are numerous, about 12 or 14. They are driven by an air engine, and are fed through long tubes placed in an inclined position over the machines, and one by one these clever machines weigh them, and like stern sentinels pass the honest sovereigns to the right hand, but without ceremony, kick the light one, which is found wanting, into another basket. These machines are beautiful. Their perfect automatic action excites admiration. The sovereigns which pass this infallible and equally inflexible judge are put into bags and have the honor of again asserting their honest value in the busy world. With regard to those which have been placed in this beautiful balance and found wanting, they are cut to pieces and afterwards cast into a burning fiery furnace at the Mint, and there regenerated in full weight and measure, made bright and beautiful, and impressed with the image of Queen Victoria.

**SAWDUST SOAP.**—A manufacturer in Tilist, instead of adding infusorial earth or ground quartz to the soap mass and thus producing a sapollo, introduces a considerable quantity of very fine sawdust, previously ground and sifted. The wood fiber acts mechanically as a detergent, and besides cleaning rapidly and thoroughly, occasions a saving of one-third in the consumption of soap. The soap does not contain an excess of soda, and has no ill effect on the hands. An analysis of a specimen eight days old yielded—grease, 44%; soda, 6%; wood, glycerine, coloring matter, 10%; water, 40%. The price at the factory is about five cents per pound.

**PRESERVATION OF LIME JUICE.**—Lime or lemon juice may be preserved as follows: Heat the juice, to coagulate albuminous matters, and then sweeten with pure glycerine. The glycerine will not only retard turgid growths, but prevent the juice from freezing even during the coldest winters.

**IMPERVIOUS MATERIAL FOR DRY METERS.**—A want long felt, as in the construction of dry meters, etc., of a good elastic material, impervious to water and to burning gas, and at the same time unaffected by hydrocarbons condensing from the gas, or impurities in it, has been met, according to Dr. Tieftrunk, by an article recently produced by Engineer Schilke, which will doubtless meet with many applications. Dry meters, in which it has been employed, have been noticeably affected by use for half a year. Dry pressure regulators made with it have also been found very superior to the wet ones generally in use, and Dr. Tieftrunk states that by means of them he can regulate the temperature of an air or oil bath so that the highest variation would not exceed 2°. The article consists of woven material, impregnated with a substance that precipitates in the pores, and which combines a high degree of elasticity with the requisite strength, and is not rendered sticky, and does not lose its imperviousness or elasticity under the influence of the hydrocarbons present in burning gas. A sample was not impaired in any of these particulars by an immersion of three days, at a constant temperature of 104° in hydrocarbons extracted from gas by cooling it at 4° below zero. The same was true after digestion with a solution of carbonate of ammonia, and with bisulphide of carbon.

**HOW A SILK-WORM MOTH GETS OUT.**—It has usually been supposed that all the silk-worm moths issue from the cocoon by moistening the threads and pushing through them. This is, however, not the case with *A. luna*, a large, handsome, pale-green moth, with long "tails" on its hind wings. Our attention was called to a rattling, cutting, or tearing noise, issuing from a cocoon of this moth. On looking at the cocoon, a sharp, black point was seen moving to and fro, and then another, until both points had cut a slit, through which the shoulders of the moth could be seen. The hole is made in a minute or two, and the moth works its way at once out of the slit. The wings at this time being very small and flabby, the points stick out, and can be used for the purpose indicated. In half an hour after exclusion from the cocoon the wings become fully expanded; but the black points can still be seen through the hairs immediately at the base of the wings. In this case no fluid was seen to exude from the moth and the cocoon was perfectly dry.

**ROMANIAN AMBER.**—According to H. Biziste, of Bucharest, says the *American Builder*, Romanian amber differs totally from the German amber found on the shores of the Baltic sea. Both are the fossil resins of anieliniferous trees and agree in chemical composition but differ in color. German amber is found only of light colors—yellow, white and pink—while Romanian amber is red, pink, brown, blue, green and black. These colors are frequently found mixed in a single piece, and we also have lumps with silver-colored veins and gold specks. On account of this variety of colors, the Romanian amber is highly esteemed, and the darker and more beautiful pieces are more costly than yellow amber, especially as they are far more rare.

**AN AMERICAN SUBSTITUTE FOR GUM-ARABIC.**—It is said that the mesquite gum of Western Texas is almost identical with gum-arabic, and, during the past year, has become an article of export, some twelve thousand pounds having been gathered in Bexar county, and as much more between that and the coast. This gum exudes from the stem and branches of the mesquite, a mimosa, several species of which grow in Texas, New Mexico and Arizona.—*Journal of Microscopy*.

**GRAVITY OF WOODS.**—The woods which are heavier than water are Dutch box, Indian cedar, ebony, lignum-vite, mahogany, heart of oak, pomegranate, vine. Lignum-vite is one-third heavier, pomegranate rather more. On the other hand, cork, having a specific gravity of .24, and poplar, .383, are the lightest woody products.

## GOOD HEALTH.

## To Lower the Temperature in a Sick Room.

Dr. Henry N. Dodge, of Morristown, gives the following to the *Scientific American* as the result of his experience: A few weeks ago, while thinking with some anxiety of the dangers which the approaching hot weather might bring to his teaching child, the idea occurred to the writer that the temperature of a heated room might be lowered by keeping the window awnings saturated with water or any volatile fluid.

By this means not only would the air which entered the windows be cooled by contact with the cool wet surface of the canvas, but also by evaporation of the moisture from the awnings. Accordingly, on the following day, a brass tube having a diameter of one-quarter of an inch was so placed that it would lie across the outside surface of the awning at a distance of a few inches from the upper edge, which is attached by books and rings to the house. The ends of the tube, being bent at right angles to the tube, hung down by the sides of the awning about six inches. All along the side of the tube which touched the awning were drilled, at intervals of three inches, holes about the size of a pin. One end of the brass tube was closed and over the other end was slipped a small indiarubber tube. This tube was carried in at the open window and con-

ducted by an ordinary screw coupling to the nearest cold water faucet. The awnings of three windows of the nursery having been supplied with this simple apparatus, the water was turned on, and, after passing through the rubber tubing, escaped through the perforations in the metal tubes, and, flowing evenly over the front and sides of the awnings, dripped upon the tin roof of the porch below the windows—a miniature summer shower. In a short time a refreshing coolness and moisture of the atmosphere remained on the breezes blowing into the windows from off the surface of a lake. A thermometer hung outside of the window under the awning, while still dry, showed a temperature of 97° F. Upon turning the water on, the mercury sunk in 15 minutes to 90° F., the thermometer still hanging below the awning, but protected from contact with the water. A still more marked effect might be produced by passing the rubber tube through a coil of broken ice. The apparatus is inexpensive; the amount of water used is small, while the comfort which it might bring to a sick child or a feeble invalid might be very great. The apparatus does not interfere with the rising or lowering of the awning; and should the dripping be objectionable where there is no roof below to receive it, a small gutter of canvas or metal could be readily attached to the lower edge of the awning to carry off the water; or a small flow of water may be used, enough only to keep the canvas moist.

## Vulcanized Rubber Not Poisonous.

Those of our readers who have "shuddered" lest they were pressing poison to their lips in the red rubber plate in which their "toughened" teeth were set, may reassure themselves. The subject has been taken up and thoroughly investigated by scientific men, and in the *Chemical News* we read the review of the case and the verdict of acquittal.

An impression has long prevailed that it was possible for the salts of mercury, used to color red vulcanite, to exert a poisonous influence where red rubber plates were worn in the mouth; and the attention of the Odontological Society having been strongly drawn to the subject by Dr. Bistaurst, Woodman's papers, relating cases of supposed mercurial poisoning from this cause, a committee was appointed to collect evidence and report upon the subject. Their inquiries have, however, utterly failed to establish the existence of a single case of unquestionable, or even probable, mercurial poisoning due to the use of red vulcanite plates. The committee requested Prof. Arndt to make "an investigation of the influence, if any, of saliva and the other fluids of the human body on the pink and red varieties of vulcanite used by dentists in making artificial teeth-plates, gums and palates." These tinted varieties of vulcanite are made by heating pink or red "dental rubber," under pressure, to a temperature of 310° to 315° F. (154° to 157° C.), the "dental rubber" being prepared by incorporating sulphur and vermilion with pure indiarubber. The following are the results of Dr. Arndt's investigation: 1. So far as any action on man is concerned, vermilion is a harmless substance. 2. So far as any effort or influence of the vermilion is concerned, the mixture of vermilion, sulphur and indiarubber, commonly termed "dental rubber," is also a perfectly innocuous substance. 3. Pink or red dental vulcanite, even when placed under the severest conditions of experiment, does not yield any trace of mercury to saliva, or, indeed, to other far more powerful solvents. 4. The metallic pins and braces in dental vulcanite do not displace mercury, or induce the formation of any compound of mercury soluble in saliva or in more powerful solvents. Dr. Arndt is therefore of the opinion that vermilion vulcanite teeth-plates are practically unaffected by saliva, or by any substance which ever gains access to the mouth; and, in short, that the pink and red vulcanite artificial gums and palates now so generally worn are absolutely harmless.

**DIARRHOEA IN HOT COUNTRIES.**—In *New Remedies*, Dr. Talmay prescribes for the diarrhoea of hot countries, from 20 to 300 grams of lactose, or sugar of milk, daily. He administers it in the simplest way—the sugar, dissolved in a little water, or as a draught in the course of the day. An excellent mode of administration consists in putting the dose of milk to be taken into half a liter or two liters of milk, according to the habits and the digestive capacities of the patient. The treatment is spread over several months, diminishing the dose as nutrition becomes more considerable and easier. According to M. Talmay's little work (published by Cocoon, Paris), the endemic diarrhoea of hot climate is the result of a functional lesion of the liver, which results in the diminution and even the suppression of the glycogenic function of the liver. The sugar of milk may thus replace the glucose which is wanting in the blood.

**SALICINE FOR CHILLS.**—Dr. Thompson reports, in *British Medical Journal*, a number of cases showing the superior efficacy of salicine in the treatment of intermittents. Cases wherein quinine had utterly failed were promptly relieved with this agent. He used large doses, grs. xxx every two hours. Usually the fourth dose was sufficient to break up the chain of morbid action, after which a few doses at longer intervals completed the cure. It may be given when the chill is on, and will usually shorten the chill, and greatly mitigate or even arrest the febrile exacerbation.





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Our latest forms go to press on Thursday evening.

SAN FRANCISCO:

Saturday Morning, Sept. 8, 1877.

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#### The Week.

The absorbing topic of the week has been the election, and both city and country have been in a state of excitement concerning it. Election day passed off quietly everywhere, however, and as we write (Thursday) those interested are in a state of expectation as to the result. We are glad it is all over, and our interior exchanges will have more time to give to local interests outside of politics, that subject having been an absorbing one for some time past. The principal item of interest in connection with mining matters is the decision of the United States Supreme Court in the matter of the bullion tax in Nevada, given on an appeal from the Circuit Court of that State. It was held by the appellant that the State had no right to enforce the tax as the title to the land from which the mineral was taken still rested in the United States. The Supreme Court decides that this point is not well taken; that, as the claim may be sold, transferred, mortgaged or inherited, without infringing the title of the United States, it may also be subjected to a lien for taxes; and the claim, such as it is, recognized by the statute, may be sold to enforce the lien. It is therefore decided that the law is valid. Want of space in this issue prevents us giving the full text of the decision, which we defer until next week.

The extension of Voelters's wood pulp reducing patent disappoints the expectations of a fall of two cents per pound on printing paper, which was expected to result soon from the expiration of this patent.

DAMAGE to the amount of \$3,000 resulted from a boiler explosion at Beucica, Friday afternoon.

#### The Use of Mining Terms.

The decision in the case of the Eureka Consolidated mining company vs. the Richmond Consolidated company (limited), was given in favor of the Eureka company on the 22d ult., at which time we gave a synopsis of it. We give elsewhere in this issue the decision in full, having, until now, been unable to obtain an official copy. The case has attracted a great deal of attention in mining circles, and the decision is a decidedly important one to the mining community, involving, as it does, not only such an amount of money, but an important construction of the United States mining laws. In one respect it reminds of us a remarkable trial which took place in Edinburgh in 1853, before the Lord Justice-General and a special jury, to try the question—what is "coal." The owner of an estate had granted a lease of the whole coal contained in it. In the course of working the lessees extracted a combustible mineral of great value as a source of coal gas, and they realized a large profit by selling it as gas coal. The lessor denied that the mineral in question was coal, and disputed the right of the lessees to work it. At the trial there was a great array of scientific men, including chemists, hotsuists, geologists, microscopists, practical gas engineers, coal viewers, and others. On the one side it was maintained that the mineral was coal, and on the other that it was a bituminous schist. The evidence, as might be supposed, was conflicting. The judge accordingly ignored the scientific testimony altogether, and summed up as follows: "The question for you to consider is not one of motives, but what is this mineral? Was it coal in the language of those persons who deal and treat with that matter, and in the ordinary language of Scotland? Because, to find a scientific definition of coal, after what has been brought to light during this trial, is out of the question. But was it coal in the common use of that word—as it must be understood to be used in language that does not profess to be the purest science, but in the ordinary acceptance of business transactions reduced to writing? Was it coal in that sense? That is the question for you to solve." The jury found that it was coal.

The judges in the Eureka case appear to have acted in the same way, and ignored for the most part all the scientific evidence, taking a common sense view of the matter. The array of experts at the trial was formidable, and to the assertions of some of them the same word might be applied. When half a dozen experts are employed on one side, and half a dozen on the other, in any case, there is apt to be some considerable difference of opinion; and more especially when some of them have derived their knowledge from books and some from practice. Had time and space permitted, we should have liked now to have quoted largely from the evidence given, but in this instance confine ourselves to a few remarks upon the use of certain mining terms in connection with it.

Lode is a very old term. In Price's "Treatise on Minerals, Mines and Mining," containing the theory and history of strata, fissures, lodes, etc., to which is added an explanation of the terms and idioms of miners, published in London, in 1778, the definition is as follows: Lode (main-rake, N. England). The word lode is an old Anglo-Saxon word; same as lead; so lode-stone as lead-stone (see Lye's edition of Junius); any regular vein or course, either metallic or not; but more commonly it means a metallic vein; and being occupied and proving good, may be indifferently called a lode, vein, or work." It will be seen by this that the word was old even a hundred years ago. The generally accepted meaning of the word by miners has a very narrow signification. It means a large-sized metalliferous vein, with well defined hanging and foot walls. On the other hand, "ledge," which we think is a California term, has such a broad signification that we can hardly tell what it means. So that, in locating a mining claim, if the posted notice claims a ledge or lode with 200 feet on each side of it, they mean all the minerals within the 400 feet wide for the length of the claim at surface, and to follow them down wherever they go. According to this decision, hereafter miners may know that when they locate claims upon an ore channel, whether the ore is found in a continuous fissure or a succession of deposits, the claim will be held as a "lode."

We cannot understand why the scientific experts engaged in the trial should call the metalliferous limestone bed a zone. We have looked over all the English works on geology which we have by us, and cannot find a precedent for the use of the word "zone" in this connection. In geography, zoology and botany, it is common enough, but we are not familiar with it in reference to mining matters.

In regard to the use of the words "dip" and "underlie," a few words may be said. The normal portion of a bed is horizontal; so the measurement of its "dip" or deviation from this normal position is naturally and necessarily made from the plane of the horizon. In metallic veins, another term conveying a different idea is commonly used, and the inclination of the lode is spoken of as its "underlie." The real meaning of the word underlie, as applied by miners to a lode, is employed to express its deviations from a vertical plane. (The normal positions of veins, conversely to that of leads, is

vertical). As a simple matter of definition, the "underlie" of a vein must be considered as the complement of its "dip," as the angle which the plane of the vein makes with a vertical plane following its strike or bearing; and as a matter of practice, the inclination of metalliferous veins is most usually and commonly expressed in this manner.

In stratified rocks it would hardly be correct to call the underlying or overlying rocks of a bed of limestone the foot wall or hanging wall.

With regard to the word "bed," Page's definition is, "a term usually applied both by geologists and quarrymen to a stratum of considerable thickness and of uniform homogenous texture, as a 'bed of sandstone,' 'bed of clay,' etc. Originally and strictly, however, the term 'bed' referred to the surface junction of two different strata, and 'seams' to the line of separation between them. Thus the upper surface of a stratum may be smooth, or it may be rough and irregular, and the under surface of the stratum deposited on it must partake of this smoothness or this irregularity—this is bedding. The line that marks the separation between two strata is a 'seam.'"

On the whole, the decision seems to have been favorably received. The gist of the whole thing is in the following words: "Our opinion, therefore, is, that both the defendant and plaintiff, by virtue of their respective patents, whether issued upon locations under the Act of 1866 or under the Act of 1872, could only follow the veins or lodes lying within lines drawn vertically downward at the end of their respective locations, and that each took the ores found in all veins or lodes, the apex or top of which lay within those lines." That is, a mining company cannot extend their work one inch beyond their end lines, but may follow any deposit of ore found within their lines to any distance beyond their cross lines.

#### Utilization of Home Products and Labor.

Unquestionably the best channel into which much of the idle capital on this coast could be put, is in founding and upholding home industry and encouraging the employment of home labor. The Pacific coast will never be thoroughly prosperous until this fact is acknowledged and until it is more generally practiced. The great difficulty our manufacturers here have to contend with is competition with eastern factories, and the fact that the merchants or importers, an influential class of the community, are decidedly opposed to assisting home industries in any way, when there is any danger of the products interfering with the sale of the imported article. The people themselves, on whom manufacturers must depend for the sale of goods, naturally buy where they can buy cheapest, provided the article suits them, so that manufacturers here in any branch must make their products both good and cheap to insure sale.

Another feature, and an important one to be considered in connection with home industries, is that the more of such institutions there are the more field there is for labor, and the better chance there is for the youth to learn trades by which they can support themselves. Again, the establishment of any new factory here tends to the utilization of home products in the shape of raw material of different kinds, so that its influence on our labor market is more widespread than a casual observer would imagine; as the collection and preparation of raw material of any kind furnishes employment to one class of labor, as its manufacture furnishes work for another class. Any man, therefore, who establishes and maintains a home industry which carries out these principles, is of more value to the community than a dozen middle-men, who simply stand between a producer in one part of the country and a purchaser in another part, demanding the profit of one and increasing the expense of another.

Probably as good an illustration of the truth of these remarks as could be found, is shown in the manufacture of furniture. The business is carried on in this city by a number of large firms, and they manufacture furniture in every variety of style and price. A great deal of this class of goods is also imported, more particularly chairs, which latter are sold here as cheap as where they are made.

In one of these factories in particular—that of the West Coast Furniture Company—are many illustrations of the ideas advanced in preceding paragraphs of this article. Here is a large establishment making quantities of furniture of all kinds from original designs, utilizing Pacific coast woods, employing skilled labor, and opening up new branches of trade which give employment and instruction combined to numerous boys and girls. The experiment in its inception was a hazardous one, a large amount of capital being involved, and very little being known of the properties of the Pacific coast woods, beyond the fact that most of them were of unique appearance when finished. Moreover, skilled workmen in this line were rare, and the market already crowded with imported goods.

By good judgment and management, however, and an earnest desire on the part of those in charge to establish a home industry creditable to all concerned, and of benefit to the community, the enterprise has been made self-sustaining and profitable. It now gives employment to about 300 of skilled workmen and boys and girls, the latter learning trades while at the

same time they are earning their living. This last feature is a pleasant one to contemplate, and one which reflects great credit on the superintendent and manager, Mr. McAllister. In a casual walk through the establishment the other day, we saw in each of the different department ten or a dozen boys or girls engaged in various kinds of labor, some of them appearing quite skillful, and all seeming contented with the work assigned to them. They all do piece work, so that the amount they earn varies with the industry and skill of the individual. In the basket making department we questioned a girl of about 15, who was making basket bottoms, as to her earnings, and found them to be from 90 cents to a dollar a day. A daily cotemporary has done the factory an injustice in a recent statement, to the effect that the girls making fancy chair bottoms only made about \$1 a week. The statement is very wide of the mark, to say the least. Those with whom we conversed seemed content with their wages and their work. Boys are employed in making baskets, mattresses, in varnishing and renovating, and in the joiners' department. In the latter department the boys are taken on a probation of three months, with no wages. If they show an inclination to be steady and learn the business they are given piece work at the end of that time, and their earnings then depend on individual effort. Some of them turn out quite creditable pieces of work, evidencing considerable skill. In each of these departments a skilled workman superintends the boys or girls, and other skilled workmen are also employed. Mr. McAllister says his men are as good a set of workmen as he would wish for, and he has never had the slightest trouble with them on the question of employment of boys and girls. No Chinamen are engaged in any of the work at all.

The basket making department in this institution has not been in operation very long, but it is one of great usefulness in many ways. The baskets are made of wood and rattan, tan bark, oak and sycamore being the principal woods. This utilizes a wood heretofore neglected in manufacturing branches. The oaks are stripped of their bark and then left to rot on the ground, but the utilization of this refuse wood in basket making gives a use for it not thought of before. In this line, moreover, an opportunity is given for boys and girls to earn a livelihood at light work in an entirely new industry inaugurated at this establishment.

There is a comparatively small market here for furniture, as California wooden products cannot stand shipment across the mountains on account of expense, and then come in direct competition with Eastern goods. It behooves all good citizens, therefore, to encourage as much as possible home industries of this sort, which utilize home products and give employment to those who need it. There is nothing at all lost in this, and a great deal gained in every way.

**MINING ACCIDENT.**—On Tuesday last the cage at the Savage mine, in which there were two men, was run up into the shafts, and one of them, John Moyle was wounded in a fatal manner, dying the same night. The accident occurred at the time when the engineers were changing shifts. Mr. Mitchell, who had the engine when the accident happened, had just come to take his shift. The finger of the dial, by means of which the rising and lowering of the cage is regulated, makes about one revolution and a half while the cage is passing the length of the shaft. When Mitchell took the engine the finger of the dial was at the same point where it would have been had the cage been at the hoh pit, some forty feet from the bottom of the shaft; while on the contrary it was at a point near the top of the shaft, having ascended till the finger of the dial had made one revolution. Thus, looking at the dial and not observing the amount of rope on the reel, he turned on a full head of steam and the cage was out of the top of the shaft and almost up into the shafts before he saw that anything was wrong. All occurred in such a short space of time that it was impossible to stop the cage after it was seen that it was going into the shafts.

**WORK IN THE UNIVERSITY LABORATORIES.**—We learn from an article in the Oakland Transcript, that Prof. Hilgard has his hands full in his laboratory. Farmers from all parts of the State are calling upon him for information concerning the material with which they are dealing, and thus they will be able to do more direct and more effective work in many cases, where the key to the affairs lies in a scientific examination. We read that the Professor now has under analysis samples of California sumac, from Orange, Los Angeles, and from San Diego. He has several samples of sugar beets from different parts of the State. He has contributions of soil from Santa Rosa, Tomales, Stockton and other places, which he analyzes and determines the best fertilizer to be used and what quantity is needed. Also alkali soils from San Jose, for which he is to find something that will make it productive. He has sea weeds from Pescadero and along the coast, which he will burn, analyze the ashes, and find whether it can be used as a fertilizer, and on what soils. Thus a great amount of now useless growth on our sea coast can be utilized. Quite recently Mr. Sutton, Prof. Hilgard's assistant, made some analysis of the various cream tartars and other domestic powders, and found many and gross adulterations, the reports of which will be published in due time.



## Corrugated Glass Reflectors.

Mr. Emile Boesch, dealer and manufacturer of lamps, lanterns, reflectors, etc., whose factory is at 569 Mission street, is also an inventor of no small pretensions. Mr. Boesch has built up a very fine business in his line, and in making articles to suit special requirements, has called his inventive faculties into play to good advantage. This is more particularly shown in the line of reflectors. Boesch's patent silvered corrugated glass reflectors for halls, show windows, etc., of various styles and patterns are sold and put in place by all the prominent gas fixture dealers in the city. An engraving of one of them is shown herewith.

It will be seen by this cut, that each glass section rests upon a small flange around its entire edge, so that in case it should be broken accidentally, the pieces will not fall out, and it will only be necessary to remove one of the metallic back sections in order to replace a duplicate of glass; and this can be done by any person by simply bending the copper tabs which hold them steady in their place. A large space is left between the glass and the metal section, and as both the lower and upper rim are perforated, the air can circulate freely between the two, and as it becomes heated, it will rise and pass out the apertures on the upper rim, while cool air entering through the lower rim, it will effectually prevent the glass from over-heating. The draft or upward current, which is created by the circulation around the upper rim, also improves the quality of the light, and makes it steady, as it creates an upward air current from the inside of the reflector. This space also protects the silvering of the glass from damage, as metal, when in close contact with glass is apt to sweat and rust, injure the silvering of the glass, and destroy its reflecting quality. The perforated rims or borders make it an ornamented reflector, which, when adorned with glass prisms, becomes an elegant, cheap, prismatic chandelier. This is a great improvement over the old fashioned metallic reflectors, and the merits of the new style have brought it into extended use.

He makes a very fine exhibit of his lamps of several different kinds, near the northwest corner of the pavilion, and they are worthy of careful examination. Last evening we happened by them as he turned up the light in his mining lamp, and were almost blinded by the flood of light that blazed forth from the patent reflector. We never saw its equal. For ships, locomotive and mining lamps, they are everything he claims for them, and are absolutely necessary for safety, in our opinion, for such uses, and had much better be employed for carriages than many now in use.

## Richards' Improved Buddle.

Mr. Joseph Richards, of Battle Mountain, Nevada, has recently patented through the MINING AND SCIENTIFIC PRESS Patent Agency an improved automatic buddle, of which, having been practically applied and being now in use, our readers will be interested in a description. We have prepared a plain engraving, which will give a better understanding of the device. The improvement consists in a novel arrangement for automatically discharging the pulp upon the inclined surface of the buddle, and at the same time delivering upon the inclined surface, by the same automatic arrangement, any number of moving uniformly directed jets or streams of water for washing the ore and carrying away the light portions.

The bottom of the circular pan, A, is inclined or convex. In the center of the pan is a circular, raised portion, B, the surface of which is inclined or descending from its center to its outer edge. A timber, C, extends across above the center of the pan, and is supported by uprights. A vertical shaft steps in the center of the raised portion of the pan, while its upper end is secured in a suitable bearing in the cross timber. An upright cylinder surrounds the shaft, E, and is permanently secured to it, so that it will not rotate with the shaft.

Outside the cylinder, F, another cylinder, H, of larger diameter, but which is shorter than the other cylinder, is secured, so that both cylinders will rotate with the shaft, E.

Hollow arms, I, extend outward horizontally from the inside cylinder, F. These arms pass through the outside cylinder, H, and extend to the center rim of the pan, A, and are slightly curved in one direction. Short hollow arms, J, project horizontally from the outside cylinder, and extend out to the outer rim of the raised portion, B. The outer ends of the tubular arms, I, are closed, and a small hole is made on one side of the arms, above the outer rim of the raised portion, B, while a number of small holes are made along one side of the arms, above the inclosed surface of the pan, outside of the raised portion.

It will now be perceived that this combination of upright shaft and radiating arms form a compound Barker's mill, which will be rotated by the reaction of the water which escapes from the holes in the arms. In practice the pulp is delivered by a sluice trough, or other means, into the upper end of the outside cylinder, H, while clear water is delivered by a

suitable spout into the inner cylinder, F. The water will then fill the arms and be delivered in a line of small streams through the holes upon the inclined surface of the pan. The reaction of this escaping water will cause the entire device to rotate in a direction opposite to that in which the streams are projected. At the same time the pulp is discharged through the holes in the arms, I, upon the outer edge, or near it, of the raised platform, B, and flows down along the inclined bottom of the pan, where it is acted upon by the small jets or streams of water by which it is washed, and the lighter portion separated.

This arrangement of the water jets forms what Mr. Richards calls a hydraulic brush, which is automatically caused to sweep over the surface of the pan on which the pulp is spread, and by its gentle washing action separates the particles and carries off the lighter portions down the incline, without flowing or disturbing the body of pulp.

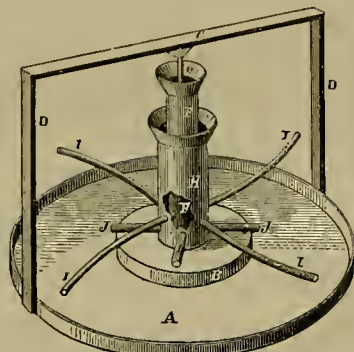
This device is extremely simple and inexpensive, as the operation is continuous and automatic, the entire operation being maintained by the hydrostatic pressure in the inside cylinder.

## Construction of the United States Mining Statutes.

Full Decision of the Eureka Consolidated vs. Richmond Consolidated Mining Companies' Suit.

We here give the full decision of the Court in the case of the Eureka Consolidated Mining Company vs. The Richmond Consolidated Mining Company, of Nevada. By stipulation the case was tried in this city before the Hon. Stephen J. Field, Justice of the Supreme Court of the United States; Hon. Lorenzo Sawyer, United States Circuit Judge of the Ninth Circuit; and Hon. E. W. Hillyer, United States District Judge for the District of Nevada. Judge Field delivered the unanimous opinion of the Court.

This is an action for the possession of certain mining ground, particularly described in the complaint, situated in Eureka mining district in the county of Eureka, in the State of Nevada. The plaintiff is a corporation created under the laws of California, and the defendant,



Richards' Improved Buddle.

The Richmond Mining Company, a corporation created under the laws of Nevada. The other defendants, Thomas Wren and Joseph Potts, are citizens of the latter State. The action was originally commenced in a State Court of Nevada, but, upon application of the plaintiff, and upon the ground of its incorporation in another State, and the presumed citizenship, from that fact, of its corporators or stockholders in that State, it was transferred to the Circuit Court of the United States.

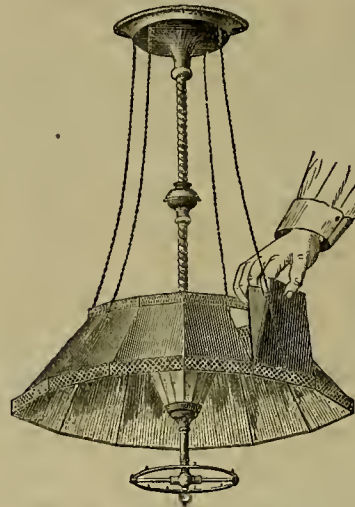
The premises in controversy are of great value, amounting by estimation to several hundred thousands of dollars, and the case has been prepared for trial with a care proportionate to this estimate of the value of the property; and the trial has been conducted by counsel on both sides with eminent ability.

Whatever could inform, instruct or enlighten the Court, has been presented by them. Practical miners have given us their testimony as to the location and working of the mine. Men of science have explained to us how it was probable that nature in her processes had deposited the mineral where it is found. Models of glass have made the hill, where the mining ground lies, transparent, so that we have been able to trace the course of the veins, and see the chambers of ore found in its depths. For myself, after a somewhat extended judicial experience, covering now a period of nearly 20 years, I can say that I have seldom, if ever, seen a case involving the consideration of so many and varied particulars, more thoroughly prepared or more ably presented. And what has added a charm to the whole trial has been the conduct of counsel on both sides, who have appeared to assist each other in the development of the facts of the case, and have furnished an illustration of the truth that the highest courtesy is consistent with the most earnest contention.

The mining ground which forms the subject of controversy is situated in a hill known as Ruby hill, a spur of Prospect mountain, distant about two miles from the town of Eureka, in Nevada. Prospect mountain is several miles in length, running in a northerly and

southerly course. Adjoining its northerly end is this spur called Ruby hill, which extends thence westerly, or in a southwesterly direction. Along and through this hill, for a distance slightly exceeding a mile, is a zone of limestone, in which, at different places throughout its length, and in various forms, mineral is found, this mineral appearing sometimes in a series or succession of ore bodies more or less closely connected, sometimes in apparently isolated chambers, and at other times in what would seem to be scattered grains. And our principal inquiry is to ascertain the character of this zone, in order to determine whether it is to be treated as constituting one lode, or as embracing several lodes, as that term is used in the Acts of Congress of 1866 and 1872, under which the parties have acquired whatever rights they possess. In this inquiry the first thing to be settled is the meaning of the term in those Acts. This meaning being settled, the physical characteristics and the distinguishing features of the zone will be considered.

Those Acts give no definition of the term. They use it always in connection with the term vein. The Act of 1866 provided for the acquisition of a patent by any person or association of persons claiming "a vein or lode of quartz, or other rock in place, bearing gold, silver, cinnabar or copper." The Act of 1872 speaks of veins or lodes of quartz or other rock in place, bearing similar metals or ores. Any definition of the term should, therefore, be sufficiently broad to embrace deposits of the several metals or ores here mentioned. In the construction of statutes, general terms must receive that interpretation which will include all the instances enumerated as comprehended by them. The definition of a lode given by geologists is, that of a fissure in the earth's crust filled with mineral matter, or more accurately, an aggregation of mineral matter containing ores in fissures. (See Von Cotta's Treatise on Ore Deposits, Prime's Translation, 26.) But miners used the term before geologists attempted to give it a definition. One of the witnesses in this case, Dr. Raymond, who for many years



Boesch's Corrugated Glass Reflector.

was in the service of the General Government as Commissioner of Mining Statistics, and in that capacity had occasion to examine and report upon a large number of mines in the States of Nevada and California and the Territories of Utah and Colorado, says that he has been accustomed as a mining engineer to attach very little importance to those cases of classifications of deposits which simply involve the referring of the subject back to verbal definitions in the books. The whole subject of the classification of mineral deposits, he states, to be one in which the interests of the miner have entirely overridden the reasonings of the chemists and geologists. "The miners," to use his language, "made the definition first. As used by miners, before being defined by any authority, the term lode simply meant that formation by which the miner could be led or guided. It is an alteration of the verb lead; and whatever the miner could follow, expecting to find ore, was his lode. Some formation within which he could find ore, and out of which he could not expect to find ore, was his lode." The term lodestar, guiding star, or north star, he adds, is of the same origin. Cinnabar is not found in any fissure of the earth's crust, or in any lode as defined by geologists, yet the Acts of Congress speak, as already seen, of lodes of quartz, or rock in place bearing cinnabar. Any definition of lode as there used, which did not embrace deposits of cinnabar, would be as defective as if it did not embrace deposits of gold or silver. The definition must apply to deposits of all the metals named, if it apply to a deposit of any one of them. Those Acts were not drawn by geologists or for geologists; they were not framed in the interests of science, and consequently with scientific accuracy in the use of terms. They were framed for the protection of miners in the claims in which they had located and developed, and should receive such a construction as will carry out this purpose. The use of the terms vein and lode in connection with each other in the Act of 1866, and their use in connection with the term ledge in the Act of 1872, would seem to indicate that it was the object of the legislator to avoid any limitation

in the application of the Acts which a scientific definition of any one of these terms might impose.

It is difficult to give any definition of the term, as understood and used in the Acts of Congress, which will not be subject to criticism. A fissure in the earth's crust—an opening in its rocks and strata made by some force of nature, in which the mineral is deposited, would seem to be essential to the definition of a lode in the judgment of geologists. But to the practical miner, the fissure and its walls are only of importance as indicating the boundaries within which he may look for and reasonably expect to find the ore he seeks. A continuous body of mineralized rock lying within any other well defined boundaries on the earth's surface and under it, would equally constitute, in his eyes, a lode. We are of opinion, therefore, that the term as used in the Acts of Congress is applicable to any zone or belt of mineralized rock lying within boundaries clearly separating it from the neighboring rock. It includes, to use the language cited by counsel, all deposits of mineral matter found through a mineralized zone or belt coming from the same source, impressed with the same forms, and appearing to have been created by the same processes.

Examining, now, with this definition in mind, the features of the zone which separate and distinguish it from the surrounding country, we experience little difficulty in determining its character. We find that it is contained within clearly defined limits, and that it bears unmistakable marks of originating, in all its parts, under the influence of the same creative forces. It is bounded on the south side, for its whole length, at least so far as explorations have been made, by a wall of quartzite of several hundred feet in thickness; and on its north side, for a like extent, by a belt of clay or shale, ranging in thickness from less than an inch to 70 or 80 feet. At the east end of the zone, in the Jackson mine, the quartzite and shale approach so closely as to be separated by a bare seam, less than an inch in width. From that point they diverge, until on the surface in the Eureka mine, they are about 500 feet apart, and on the surface in the Richmond mine, about 800 feet. The quartzite has a general dip to the north, at an angle of about 45°, subject to some local variations, as the course changes. The clay or shale is more perpendicular, having a dip at an angle of about 80°. At some depth under the surface, these two boundaries of the limestone, descending at their respective angles, may come together. In some of the levels worked, they are now only from 200 to 300 feet apart.

The limestone found between these two limits—the wall of quartzite and the seam of clay or shale—has, at some period of the world's history, been subjected to some dynamic force of nature, by which it has been broken up, crushed, disintegrated, and fissured in all directions, so as to destroy, except in three or four places of a few feet each, so far as explorations show, all traces of stratification; thus specially fitting it, according to the testimony of the men of science to whom we have listened, for the reception of the mineral which, in ages past, came up from the depths below in solution, and was deposited in it. Evidence that the whole mass of limestone has been, at some period, lifted up and moved along the quartzite, is found in the marks of attrition engraved on the rock. This broken, crushed and fissured condition pervades, to a greater or less extent, the whole body, showing that the same forces which operated upon a part operated upon the whole, and at the same time. Wherever the quartzite is exposed, the marks of attrition appear. Below the quartzite no one has penetrated. Above the shale the rock has not been thus broken and crushed. Stratification exists there. If in some isolated places there is found evidence of disturbance, that disturbance has not been sufficient to affect the stratification. The broken, crushed and fissured condition of the limestone gives it a specific, individual character, by which it can be identified and separated from all other limestone in the vicinity.

In this zone of limestone numerous caves or chambers are found, further distinguishing it from the neighboring rock. The limestone being broken and crushed up as stated, the water from above readily penetrated into it, and operating as a solvent, formed these caves and chambers. No similar cavities are found in the rock beyond the shale, its hard and unbroken character not permitting, or at least opposing such action from the water above.

Oxide of iron is also found in numerous places throughout the zone, giving to the miner assurance that the metal he seeks is in its vicinity.

This broken, crushed and fissured condition of the limestone, the presence of the oxides of iron, the caves or chambers we have mentioned, with the wall of quartzite and seam of clay bounding it, give to the zone, in the eyes of the practical miner, an individuality, a oneness as complete as that which the most perfect lode in a geological sense ever possessed. Each of the characteristics named, though produced at a different period from the others, was undoubtedly caused by the same forces operating at the same time upon the whole body of the limestone.

Throughout this zone of limestone, as we have already stated, mineral is found in the numerous fissures of the rock. According to the opinions of all the scientific men who have been examined, this mineral was brought up in



### Improved Mining Machinery.

The Virginia Enterprise says: Persons now visiting the Comstock, who have not been here since the early days, are much surprised to see the huge engines employed in all our large mills and in the hoisting works of the leading mines. The ponderous pumping machinery is also looked upon with astonishment, and contrasted with the slight and feeble apparatus that did duty in the same line of business in former times.

#### In the Early Days of Washoe

The stockholders of a mining company stood aghast and were amazed almost to speechlessness when their Superintendent ventured to ask for an engine of 60 or 80-horse power. They thought the company would be ruined by such extravagant notions. When such engines were finally procured and set up in the mills and hoisting works, a day was appointed and scores of people—ladies as well as gentlemen—were invited to see them put in motion. A great feast was provided and spread in some part of the new works; speeches were made,

#### Champagne Flowed Like Water,

And beer was drank by the barrel. Occasionally a band of music was present, and dancing concluded the festivities. Companies that had paid out sufficient money to purchase an engine of 80 or 100-horse power became reckless, as it were, and no longer cared for expenses. Now engines of 500-horse power are started up and nobody except those particularly interested know anything about the matter; and without a word to outsiders, pumps are put in motion that would have torn down the works of early days and washed all the revelers collected in them down the sides of the mountain. All the machinery in our primitive hoisting works wouldn't have furnished ballast for a balance hoh of the present day, and a section of the column now in use would then have made a first-class smokestack.

#### Yellow Jacket New Machinery.

The machinery which is being put in at the Yellow Jacket new shaft, and in process of construction for the works there, is, in many respects, a step or two in advance of anything on the lode. Both building and machinery have been designed and are being constructed under the supervision of William H. Patton, of this city, civil and mechanical engineer, who has designed and constructed the improved machinery at the Consolidated Virginia, C. & C. shaft, Gould & Curry, Savage, Hale & Norcross, Chollar-Norcross-Savage shaft, Belcher, Overman, and other mines, and to whose study, research, invention and skill most of the improvements in Comstock machinery may be traced. The improvements made in the new machinery of the Yellow Jacket new shaft are worthy of a more particular mention than has yet been made of them.

#### The Hoisting Machinery

Consists of a double-cylinder engine, each cylinder being 18 inches in diameter and 24-inch stroke. These cylinders run two reels, each capable of holding 3,000 feet of flat wire rope half an inch thick and from four to six inches wide. The north reel is intended to handle all of the pumping machinery, and is constructed in such a manner as to multiply, when desired, the power of the engine six times, thereby giving it a lifting power of 50 tons. When not needed as a lifting engine it will be used in the same manner precisely as the south reel. This double engine is capable of sinking 3,000 feet, and of handling the pumps to that depth. In case ore is found, additional machinery will be erected to handle it.

#### The Design

Of the hoisting machinery is different from anything on the lode. It is extremely heavy and substantial, and calculated to do an immense amount of work. The gallow's frame is similar to that at the C. & C. shaft. The sheaves are placed on the top of the frame to avoid any danger of their getting out of place. The frame itself is built of selected timbers of red mountain spruce, cut at Dutch Flat, and is securely anchored to the foundation walls. It is arranged so as to allow of two landings, the same as at the C. & C. shaft, where it is found to work admirably, nearly doubling the hoisting capacity of the works. By this device four deck cages can be unloaded with only two landings. For the purpose of sinking a skip it will be used similar to that at the Combination shaft.

#### The Buildings

Will be of the same general style as those at the C. & C. shaft. That covering the hoisting works will be 42 feet wide by 140 feet deep. It is constructed so that the highest portion of the building will be directly over the shaft, and contain the ventilator. By this arrangement, no useless space is inclosed, the highest portion being over the shaft and sheaves, and the lowest over the engine, the roof approximately conforming to the slant of the cables. The building is detached entirely from the gallow's frame, so that no jar will be conveyed therefrom to the building.

#### The Boiler Room.

Provision is made for setting five pairs of boilers, which will be placed on the north side of the main building and 10 feet below the hoisting engines. This has been found to be the most economical as well as safest position for boilers in this section. The prevailing winds being from the south, the sparks are driven away from the works, while the sweep is not so directly upon the hoilers, steam drums and connecting pipes. The hoilers will be

covered by a building 48 feet wide, leaning up against the main building, and of sufficient height to give perfect ventilation to the boiler room. For the purpose of receiving the hoilers a yard sufficient for the building and to receive wood, etc., is being graded out.

#### The Pumping Engine

Is to be a compound condensing, direct-acting, rotative engine. The initial cylinder is 31 inches, the expansion cylinder 62 inches, and each has a 12-foot stroke. They are to be placed horizontally and along side of each other. The crosshead of the engine will connect directly with the head of the surface boh, and also with two fly wheels of 50 tons weight each, placed on a shaft 18 inches in diameter, and one on each side of the boh pit, thus avoiding the use of the Davy valve motion. It has been found in practice that where less than four strokes per minute of the pumps will handle the water, the Davy valve gear is advantageous, but where more than four are required, that a plain rotative engine is preferable. This pumping engine will be

#### The Most Powerful Engine on the Lode.

The pump columns are to be 14 inches in diameter, and the plunger pumps will be 14 inches in diameter by 10-foot stroke. Besides these there will be a sinking lift. The plungers are to be placed 200 feet apart in the shaft and in the usual Cornish style. The building for the pumping engine will be 61 feet wide by 90 feet long, and placed on the north side of the main hoisting building. The hoisting machinery was built by Prescott, Scott & Co., of San Francisco, and the pumping machinery is now being built by the same firm.

#### The Welland Canal.

This work is progressing satisfactorily, although not as rapidly as was at first hoped, owing to certain obstructions that were not foreseen. The work now in progress will, when completed, result in the establishment of a navigable canal with locks 270 feet long and 45 feet wide, with 14 feet depth on the sills, the canal proper having a width of 100 feet at the bottom, with a depth of 15 feet. For the present the depth of the new canal between the locks is 13 feet. The locks, which can hereafter be raised with moderate expense, are at present constructed with 12 feet on the sill. In regard to the details of this work the Chicago Railway Review says that the entrance and other locks not coming within this category are constructed with a depth of 14 feet. The new canal leaves the present line and continues from May's ravine on a separate location  $8\frac{1}{2}$  miles, and is one-third of a mile shorter than the present canal.

Work is vigorously pushed forward on all the sections. Section No. 36 embraces the enlargement and deepening of Port Colborne harbor, or Lake Erie entrance to the canal, including the extension of the west pier about 400 feet further into the lake; deepening the entrance channel from the lake inward; rebuilding the superstructure of part of the west pier, and the whole of that on the east side; constructing a beacon on the southeast side of the entrance, and building four detached hlocks of pier work between it and the outer end of the present east pier; renewing and rebuilding about 700 feet of the west docking; deepening and enlarging the basin, etc.

The channel from the lake northward to about the southern line of the contemplated enlargement of the basin is to be sunk to a depth of 17 feet below low water line, and from the latter place to the north end of the basin the depth will gradually diminish to 16 feet at a time when the water stands at 12 feet over the miter-sill of the present lock. In excavating through the rock, the mode adopted has been to drill and blast from the deck of a vessel, held in place by anchor timber resting on the bottom, and subsequently removing the loosened material by an ordinary scoop-dredging machine. This system has been so far quite successful, owing in a great measure to the use of nitro-glycerine as an explosive and the skillful arrangements made in conducting operations in all their stages. Still, with all the care and precautions adopted in storing and handling the nitro-glycerine, an explosion occurred on the 30th of October last, by which one man was killed and considerable damage done to property in the village of Port Colborne. Fully one-third of the rock has been removed and a considerable extent of ordinary dredging done. The time for completing the work was to have been the spring of 1877; but it is now understood that it will not be ready before the opening of navigation in 1880. In conclusion, the Review says: "When the improvement is completed vessels of the largest class can be locked down from Lake Erie into Lake Ontario, and vice versa, and, with the enlargement of the St. Lawrence canals, ships of over 2,500 tons burden can clear from Chicago for any part of the world, and return with cargoes shipped on through hills of lading, thus making this city the grand port of entry for an immense fleet of vessels and a direct trade, the magnitude of which cannot be estimated nor approximated at the present time."

However much this may be desired, it is not likely to take place to any considerable extent, because of the different requirements of lake and ocean navigation. The models and rig which are altogether best for salt water, are not as well adapted for fresh water navigation; hence the lake tonnage will not probably make foreign voyages, although it may be pretty extensively employed along the Atlantic coast.

### A New Utah Concentrator.

A correspondent of the Salt Lake Tribune says: Through the courtesy of E. W. Day, I visited the new automatic ore sampler of R. W. McIntosh, on Friday, and saw it start up and run a sample through. It worked so perfect that the projectors and builder of it, who were there at the time, as well as the spectators, pronounced it beyond a doubt a grand success. It takes up so little space on the floor that it does not interfere in any way with the old machinery used so successfully heretofore, and persons who prefer to have their ore sampled by the old process can be accommodated at any moment. The object of the new process is to give the miner a better sample at cheaper rates and in a great deal less time than he could get it by the old-fashioned way.

The machinery consists of crusher, elevator, with receiving and distributing hoppers and cast-iron dividers. It stands on a solid foundation, 42 feet high from the floor, with a reduction capacity of from 2,000 to 3,000 pounds. The capacity of the mill, when run at best advantage, is 10 tons per hour.

The ore to be sampled first passes into a crusher, is there pulverized, and then taken direct from the crusher to the elevator, which carries it up to a tipping hopper. When the tipping hopper contains about 250 pounds of ore, it discharges itself into the first of a series of six sampling boppers.

After the ore reaches the first sampling hopper, the gates at the bottom of the same open and discharge the ore evenly upon dividers. These dividers are so arranged that they take every alternate quarter, the same as is done by hand sampling on the floor. The sampling hopper is so constructed that the ore must pass from one to the other, and each time the ore reaches the next hopper in its descent it is thoroughly mixed, thereby mixing every 250 pounds equal to the whole lot as heretofore. The machine is so perfectly arranged that there cannot possibly be the ghost of a show for any person to tamper with a sample. The car which contains the sample is inclosed in a casing, which is 14x18 feet at the base, and runs up over the top to a barrel. This case is in charge of the foreman, who takes the key thereof until the sample is delivered to the plate room.

The designer of this machine is F. W. Day, and the work was perfected and machinery put up in first-class running order by W. J. Silver, of Salt Lake City. Another grand feature about it is, that every part of this new enterprise is home-made and entirely original. Already patents have been applied for, and Dick McIntosh has reason to congratulate himself on its success, for it is bound to be a great source of revenue to him and others who may be connected with it.

### French Railway System.

In a memoir of M. de Franqueville, M. F. Jacquin reviews the relations between the railways and the state, in different countries, coming to the conclusion that France alone has solved the difficult problem of reconciling these two grand principles: authority and liberty. The whole territory of France is divided into six grand railway departments, in each of which, with a few unimportant exceptions, all the railways have been conceded to a single company.

Office hooks, very well devised, define the rights of the state and those of the company. Free to move within prescribed limits, the administrative councils and their immediate subordinates strive to develop commercial relations, or even to create them where they do not already exist.

In each department the different modes of technical working, the improvements to be made in the rolling stock, the questions relative to maintenance, to beneficial funds, and to retiring pensions for a clientele of more than 200,000 men, are all daily and carefully studied under different aspects, the very diversity of view furnishing guarantees of true progress and success.

At the same time the state, invested with important rights, by those same office hooks, exercises a continual surveillance over the companies. By the engineers of control and the subordinate commissioners, it is informed of the least incident which occurs on the roads. No tax is collected without having been confirmed—that is to say, without it has been shown by thorough examination that it is according to conditions of the contract. By inspection of finances the state penetrates into all the details of the combined action of the companies.

In time of peace the state is thus in a position to intervene at any instant in the management of the railway companies, and to protect the public, if necessary, against monopoly. In time of war, the immense property of the companies, together with their numerous discipline and systematized corps, pass under the control of the state; the workshops of the companies, true arsenals, are ready to execute the most difficult commands, to grind wheat and to make arms.

In fine, in 80 years, the entire network, which will have cost nearly \$3,000,000,000, will be completely redeemed; all the capital and bonds will be reimbursed by annual levies on the working receipts, and the state will enter into full possession of a property sufficient to extinguish the public debt.

This system of equilibrium between the state and the companies, which the English call the

"French system," may thus briefly be defined:

The association of the state and the companies, formed in order to assure the completion of the national network of railways, the advantages of the prosperous lines being partly employed for the benefit of the unproductive lines.

### Wagon Materials.

To those who have never investigated the matter, the extent of the trade in materials for the construction of wagons in this city, is beyond their comprehension. It is simply enormous, and employs hundreds of thousands of capital, several large buildings and many men. Knowing the extent to which the importation of State built wagons had lately been carried, to us it seemed incredible that such an amount of the raw material should be required to supply the trade, as we found stored upon the premises of Meeker, James & Co. We found their large store 45x137, on Market, stored full from top to bottom, and another warehouse of equal size on Spear street piled full of plank used in wagon building. To be sure this is the leading firm in this business here, but it is not the only one, and when we reflect that several other firms are also in this trade, and one or two nearly as heavily as Messrs. M., J. & Co., some idea of the extent of the carriage and wagon makers' operations on the Pacific coast may be obtained.

Meeker, James & Co. make a fine representative exhibit of their stock in the northwest corner of the pavilion, very tastily and snugly arranged, and we found therein so many of the improvements of the past five years in carriage findings, that we were at a loss to name them all, and concluded to go to their regular establishment, No. 117 and 119 Market street, and brush up our carriage sense a little. We found out that a workman can build a buggy or wagon for 20% less now than he could ten years ago, by reason of the material being so much better fitted to his hand by machinery than used to be the case. We found out that there is nothing required in the building of either carriage, buggy, or wagon, that was not to be had in this complete establishment. We found there spokes of the finest timber from  $\frac{3}{4}$  to 5 inches, by the cord; we found bent rims from 1 inch to 8 inches wide; hubs from 3 inches to 17 inches; basswood, white wood, ash, oak, hickory, and other plank of the finest quality, dry and hard as baked bones; carriage hardware of the latest patterns and patents including fifth wheels of a pattern made exclusively for this house; half patent and Concord axles of iron, steel, and converted steel, all sizes. We also found that clips are now being pressed of the required shapes and sizes for all work, out of the best wrought Norway iron, that are far better and a hundred per cent. cheaper than hand welded and made ones; steps, foot rails, seat irons, pole and single tree irons of wrought iron, and many other such things that ordinarily have been left for the blacksmith to forge out laboriously by hand or were made of malleable cast iron, which any one knows is inferior to wrought. It is this pressing of clips, rails, steps, and similar carriage furnishing articles, that has made vehicles cheaper and better in the market than formerly.

Messrs. Meeker, James & Co., are sole agents for their premises. They are also sole agents for the celebrated rubber-cushioned axles that are now so generally coming into use in Eastern cities. This is an adaptation of rubber to wagon wheels, whereby the boxes that convey the axles rest on rubber, and the whole load is as it were on springs in the wheel, thereby relieving the wheel and spindle of the jar and strain consequent to heavy loads over rough pavement, to say nothing of the saving on teeth it is to the driver. They are also agents for Silver & Deming's patent hub boxing machine, and their improved spoke-tenoning machine, both of which are invaluable auxiliaries to correct wheel building, and are on exhibition in the pavilion. They also are agents for Sarvin patent wheels, of which they sold 350 sets in 1876. For country use they cannot be excelled by any wheel built, though not so well liked in the city on the rough stone pavement.—*Fair Daily.*

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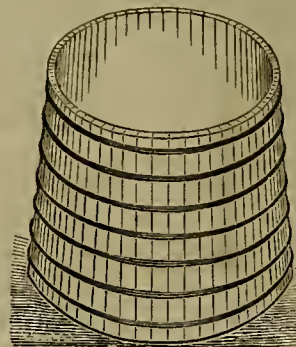
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Continued from page 153

solution from the depths of the earth below, and would therefore naturally be very irregularly deposited in the fissures of the crushed matter, as these fissures are in every variety of form and size, and would also find its way in minute particles in the loose material of the rock. The evidence shows that it is sufficiently diffused to justify giving to the limestone the general designation of mineralized matter—metal-bearing rock. The three scientific experts produced by the plaintiff, Mr. Keyes, Mr. Raymond and Mr. Hunt, all of them of large experience and extensive attainments, and two of them of national reputation, have given it as their opinion, after examining the ground, that the zone of limestone between the quartzite and the shale constitutes one vein or lode, in the sense in which those terms are used by miners. Mr. Keyes, who for years was superintendent of the mine of the plaintiff, concludes a minute description of the character and developments of the ground by stating that, in his judgment, according to the customs of miners in this country and common sense, the whole of that space should be considered and accepted as a lead, lode, or ledge of metal-bearing rock in place.

Dr. Raymond, after giving a like extended account of the character of the ground, and his opinion as to the causes of its formation, and stating with great minuteness the observations he had made, concludes by announcing as his judgment, after carefully weighing all that he had seen, that the deposit between the quartzite and the shale is to be considered as a single vein in the sense in which the word is used by miners—that is, as a single ore deposit of identical origin, age and character throughout.

Dr. Hunt, after stating the result of his examination of the ground, and his theory as to the formation of the mine, gives his judgment as follows:

"My conclusion is this: That this whole mass of rock is impregnated with ore; that although the great mass of ore stretches for a long distance above horizontally and along an incline down the foot wall, as I have traced it, from this deposit you can also trace the ore into a succession of great cavities or bonanzas lying irregularly across the limestone and into smaller caverns or chasms of the same sort; and that the whole mass of the limestone is irregularly impregnated with the ore. I use the word impregnation in the sense that it has penetrated here and there; little patches and stains, ore-veins, and caverns and spaces of all sizes and all shapes, irregularly disseminated through the mass. \* \* \* I conclude, therefore, that this great mass of ore is, in the proper sense of the word, a great lode, or a great vein, in the sense in which the word is used by miners; and that practically the only way of utilizing this deposit, is to treat the whole of it as one great ore-bearing lode or mass of rock."

This conclusion as to zone constituting one lode of rock-bearing metal, it is true, is not adopted by the men of science produced as witnesses by the defendant, the Richmond mining company. These latter gentlemen, like the others, have had large experience in the examination of mines, and some of them have acquired a national reputation for their scientific attainments. No one questions their learning or ability, or the sincerity with which they have expressed their convictions. They agree with the plaintiff's witnesses as to the existence of the mineralized zone of limestone, with an underlying quartzite and an overlying shale; as to the broken and crushed condition of the limestone, and substantially as to the origin of the metal and its deposition in the rock. In nearly all other respects they disagree. In their judgment, the zone of limestone has no features of a lode. It has no continuous fissure, says Mr. King, to mark it as a lode. A lode, he adds, must have a foot wall and a hanging wall, and if it is broad, these must connect at both ends and must connect downwards. Here there is no hanging wall or foot wall; the limestone only rests as a matter of stratigraphical fact on underlying quartzite and the shale overlies it. And distinguishing the structure at Ruby hill from the Comstock lode, the same witness says that the one is a series of sedimentary beds laid down in the ocean and turned up; the other is a fissure extending between two rocks.

The other witnesses of the defendant, so far as they have expressed any opinion as to what constitutes a lode, have agreed with the views of Mr. King. It is impossible not to perceive that these gentlemen at all times carried in their minds the scientific definition of the term as given by geologists—that a lode is a fissure in the earth's crust filled with mineral matter—and disregarded the broader, though less scientific definition of the miner, who applies the term to all zones or belts of metal-bearing rock lying within clearly marked boundaries. For the reasons already stated, we are of opinion that the Acts of Congress use the term in the sense in which miners understand it.

If the scientific definition of a lode, as given by geologists, could be accepted as the only proper one in this case, the theory of distinct veins existing in distinct fissures of the limestone, would be not only plausible but reasonable, for that definition is not met by the conditions in which the Eureka mineralized zone appears. But as that definition cannot be accepted, and the zone presents the case of a lode as that term is understood by miners, the theory of separate veins, as distinct and disconnected bodies of ore, falls to the ground. It is,

therefore, of little consequence what name is given to the bodies of ore in the limestone, whether they be called pipe veins, rake veins or pipes of ore, or receive the new designation suggested by one of the witnesses, they are but parts of one greater deposit, which permeates, in a greater or less degree, with occasional intervening spaces of barren rock, the whole mass of limestone, from the Jackson mine to the Richmond, inclusive.

The Acts of Congress of 1866 and 1872 dealt with a practical necessity of miners; they were passed to protect locations on veins or lodes, as miners understood those terms. Instances without number exist where the meaning of words in a statute has been enlarged or restricted and qualified to carry out the intention of the Legislature. The inquiry, where any uncertainty exists, always is as to what the Legislature intended, and when that is ascertained, it controls. In a recent case before the Supreme Court of the United States, singing birds were held not to be live animals, within the meaning of a Revenue Act of Congress. (*Reiche v. Smythe*, 13 Wall, 162.) And in a previous case, arising upon the construction of the Oregon Donation Act of Congress, the term, a single man, was held to include in its meaning an unmarried woman. (*Silver v. Ladd*, 7 Wall, 219.) If any one will examine the two decisions, reported as they are in Wallace's Reports, he will find good reason, for both of them.

Our judgment being that the limestone zone in Ruby hill, in Eureka district, lying between the quartzite and the shale, constitutes, within the meaning of the Acts of Congress, one lode of rock-bearing metal, we proceed to consider the rights conveyed to the parties by their respective patents from the United States. All these patents are founded upon previous locations, taken up and improved according to the customs and rules of miners in the district. Each patent is evidence of a perfected right in the patentee to the claim conveyed, the initiatory step for the acquisition of which was the original location. If the date of such location be stated in the instrument, or appear from the record of its entry in the local land office, the patent will take effect by relation as of that date, so far as may be necessary to cut off all intervening claimants, unless the prior right of the patentee, by virtue of his earlier location, has been lost by a failure to contest the claim of the intervening claimant, as provided in the Act of 1872. As in the system established for the alienation of the public lands, the patent is the consummation of a series of acts, having for their object the acquisition of the title, the general rule is to give to it an operation by relation at the date of the initiatory step, so far as may be necessary to protect the patentee against subsequent claimants to the same property. As was said by the Supreme Court in the case of *Shepley vs. Cowan* (1st Otto, 338), where two parties are contending for the same property, the first in time in the commencement of proceedings for the acquisition of the title, when the same are regularly followed up, is deemed to be the first in right.

But this principle has been qualified in its application to patents of mining ground, by provisions in the Act of 1872, for the settlement of adverse claims before the issue of the patent. Under that Act, when one is seeking a patent for his mining location and gives proper notice of the fact as there prescribed, any other claimant of an unpatented location objecting to the patent of the claim, either on account of its extent or form, or because of asserted prior location, must come forward with his objections and present them, or he will afterwards be precluded from objecting to the issue of the patent. While, therefore, the general doctrine of relation applies to mining patents so as to cut off intervening claimants, if any there can be, deriving title from other sources, such perhaps as might arise from a subsequent location of school warrants or a subsequent purchase from the State, as in the case of *Heydenfeldt vs. Daney Gold Mining Company*, reported in the third of Otto, the doctrine cannot be applied so as to cut off the rights of the earlier patentee, under a later location, where no opposition to that location was made under the statute. The silence of the first locator is, under the statute, a waiver of his priority.

But from the view we take of the rights of the parties under their respective patents, and the locations upon which those patents were issued, the question of the priority of location is no practical consequence in the case.

The plaintiff is the patentee of several locations on the Ruby Hill lode, but for the purpose of this action it is only necessary to refer to three of them—the patents for the Champion, the At Last, and the Lupita or Margaret claims. The first of these patent was issued in 1872, the second in 1876, and the third in 1877. Within the end lines of the locations, as patented in all these cases, when drawn down vertically through the lode, the property in controversy falls. Objection is taken to the validity of the last two patents, because the end lines of the surface locations patented are not parallel, as required by the Act of 1872. But to this objection there are several obvious answers. In the first place, it does not appear upon what locations the patents were issued. They may have been, and probably were, issued upon locations made under the Act of 1866, where such parallelism in the end lines of the surface locations was not required. The presumption of the law is that the officers of the Executive Department specially charged with the supervision of applications for mining patents, and the issues of such patents, did their duty; and

in an action of ejectment, mere surmises to the contrary will not be listened to. If, under any possible circumstances, a patent for a location without such parallelism may be valid, the law will presume that such circumstances existed. A patent of the United States for land, whether agricultural or mineral, is something upon which its holder can rely for peace and security in his possessions. In its potency it is ironclad against all mere speculative inferences. In the second place, the provision of the statute of 1872, requiring the lines of each claim to be parallel to each other, is merely directory, and no consequence is attached to a deviation from its direction. Its object is to secure parallel end lines drawn vertically down, and that was effected in these cases by taking the extreme points of the respective locations on the length of the lode. In the third place, the defect alleged does not concern the defendant, and no one but the Government has the right to complain.

The defendant, the Richmond mining company, also holds several patents issued to it upon different locations; but in this case it specially relies upon the patents of the Richmond and Tip Top claims. It is alleged that these patents were issued upon locations made earlier than any upon which the patents to the plaintiff were issued. Assuming this to be the fact, and claiming from it that the patents antedate in their operation, by relation back to such locations, the patents of the plaintiff; and the further fact that the locations were made under the Act of 1866, the defendant relies to defeat the pretensions of the plaintiff. It contends that inasmuch as the croppings of the vein it works are within the surface of its patented locations, it can follow the vein wherever it leads, though it be outside of the end lines of the locations when vertically drawn down through the lode. Its position is that, whenever, under the law of 1866, a location was made on a lode or vein, a right was acquired to follow the vein wherever it might lead, without regard to the end lines of the location. This position is urged with great persistence by one of the counsel of the defendant, and with the ability which characterizes all his discussions.

The second section of the Act of 1866, upon the provisions of which this position is based, provides, "That whenever any person or, association of persons, claims a vein or lode of quartz, or other rock in place, bearing gold, silver, cinnabar or copper, having previously occupied and improved the same according to local customs or rules of miners in the district where the same is situated, and having expended, in actual labor and improvements thereon, an amount of not less than \$1,000, and in regard to whose possession there is no controversy, or opposing claim, it shall and may be lawful for said claimant or association of claimants to file in the local land office a diagram of the same, so extended, laterally or otherwise, as to conform to the local laws, customs and rules of miners, and to enter such tract and receive a patent therefor, granting such mine, together with the right to follow such vein or lode, with its dips, angles and variations to any depth, although it may enter the land adjoining, which land adjoining shall be sold subject to this condition."

It will be seen by this section that to entitle a party to a patent, his claim must have been occupied and improved according to the local customs or rules of miners of the district, and that his diagram of the same filed in the land office, in its extension, laterally or otherwise, must be in conformity with them.

The rules of the miners in the Eureka mining district, adopted in 1865—laws of the district, as they are termed by the miners—provided that claims of mining ground should be made by posting a written notice on the claimant's ledge, defining its boundaries if possible; that each claim could consist of 200 feet on the ledge, but claimants might consolidate their claims by locating in a common name, if in the aggregate no more ground was claimed than 200 feet for each name, and that each locator should be entitled to all dips, spurs and angles connecting with his ledge; and that a record of all claims should be made within 10 days from the date of location. The rules also allowed claimants to hold 100 feet each side of their ledge for mining and building purposes, but declared that they should not be entitled to any other ledge within this surface.

It will be perceived by these rules that they had reference entirely to locations of claims on ledges. It would seem that the miners of the district then supposed that the mineral in the district was only found in veins or ledges, and not in isolated deposits. In February, 1869, new rules were added to those previously passed, authorizing the location of such deposits. These new rules provided that each deposit claim should consist of 100 feet square, and that the location should take all the mineral within the ground to any depth.

Under these rules square locations and linear locations were made by parties, through whom the defendant derives title on what is called the Richmond ledge, and linear locations were made on what is called the Tip Top ledge, with surface locations for mining purposes, both parties claiming with their locations all dips, spurs and angles. It is only of the linear locations we have occasion to speak; it is under them that the defendant asserts title to the premises in controversy.

Now as neither the rules of miners in Eureka mining district, nor the Act of 1866, in terms, speak of end lines to locations made on ledges, nor in terms impose any limitation upon miners

following these veins wherever they may lead, it is contended that no such limitation can be considered as having existed and be enforced against the defendant. The Act of 1866, it is said, recognizes the right of the locator to follow his vein outside of any end lines drawn vertically down when it permits him to obtain a patent granting his mine, "together with the right to follow such vein or lode with its dips, angles and variations to any depth, although it may enter the land adjoining, which land adjoining shall be sold subject to this condition."

It is true that end lines are not in terms named in the rules of the miners, but they are necessarily implied, and no reasonable construction can be given to them without such implication. What the miners meant by allowing a certain number of feet on a ledge was that each locator might follow his vein for that distance on the course of the ledge, and to any depth within that distance. So much of the ledge he was permitted to hold as lay within vertical planes drawn down through the end lines of his location, and could be measured anywhere by the feet on the surface. If this were not so, he might, by the bend of his vein, hold under the surface along the course of the ledge double and treble the amount he could take on the surface. Indeed, instead of being limited by the number of feet prescribed by the rules, he might, in some cases, oust all his neighbors and take the whole ledge. No construction is permissible which would substantially defeat the limitation of quantity on a ledge, which was the most important provision in the whole system of rules.

Similar rules have been adopted in numerous mining districts, and the construction thus given has been uniformly and everywhere followed. We are confident that no other construction has ever been adopted in any mining district in California or Nevada. And the construction is one which the law would require in the absence of any construction by miners. If, for instance, the State were to-day to deed a block in the city of San Francisco to 20 persons, each to take 20 feet front, in a certain specified succession, each would have assigned to him by the law a section parallel with that of his neighbor, of 20 feet in width, cut through the block. No other mode of division would carry out the grant.

The Act of 1866 in no respect enlarges the right of the claimant beyond that which the rules of the mining district gave him. The patent which the Act allows him to obtain does not authorize him to go outside of the end lines of his claim, drawn down vertically through the ledge or lode. It only authorizes him to follow his vein, with its dips, angles and variations, to any depth, although it may enter land adjoining, that is, land lying beyond the area included within his surface lines. It is land lying on the side of the claim, not on the ends of it, which may be entered. The land on the ends is reserved for other claimants to explore. It is true, as stated by the defendant, that the surface land taken up in connection with a linear location on the ledge or lode is, under the Act of 1866, intended solely for the convenient working of the mine, and does not measure the miner's right, either to the linear feet upon its course, or to follow the dips, angles and variations of the vein, or control the direction he shall take. But the line of location taken does measure the extent of the miner's right. That must be along the general course or strike, as it is termed, of the ledge or lode. Lines drawn vertically down through the ledge or lode at right angles with a line representing this general course, at the ends of the claimant's line of location, will carve out, so to speak, a section of the ledge or lode within which he is permitted to work, and out of which he cannot pass.

As the Act of 1866 requires the applicant for a patent to file in the local office a diagram of his claim, such diagram must necessarily present something more than the mere linear location. It is intended that it should embrace the surface claimed, for the working of the mine. In this way each of the patents of the parties embraces one or more acres and the fraction of an acre of surface ground and some hundred linear feet on the lode.

The Act of 1872 preserves to the miner the rights acquired under the Act of 1866, and confers upon him additional rights. Under the Act of 1866, he could only hold one lode, or vein, although more than one appeared within the lines of his surface location. The surface ground was allowed him for the convenient working of the lode or vein located and for no other purpose; it conferred no right to any other lode or vein. But the Act of 1872 alters the law in this respect; it grants to him the exclusive right of possession to a quantity of surface ground not exceeding a specified amount, and not only to the particular lode or vein located, but to all other veins, lodes and ledges, the top or apex of which lies within the surface lines of his location, with the right to follow such veins, lodes or ledges to any depth. But these additional rights are granted subject to the limitation that in following the veins, lodes or ledges, the miner shall be confined to such portions thereof as lie between vertical planes drawn downward through the end lines of his location, and a further limitation upon his right in cases where two or more veins intersect or cross each other. The Act in terms annexes these conditions to the possession, not only of claims subsequently located, but to the possession of those previously located. This fact, taken in connection with the reservation of all rights acquired under the Act of 1866, indicates that, in the opinion of the Legislature, no change was made



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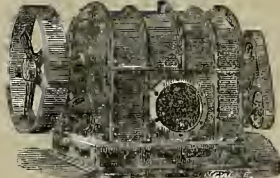
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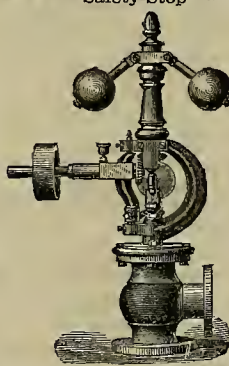
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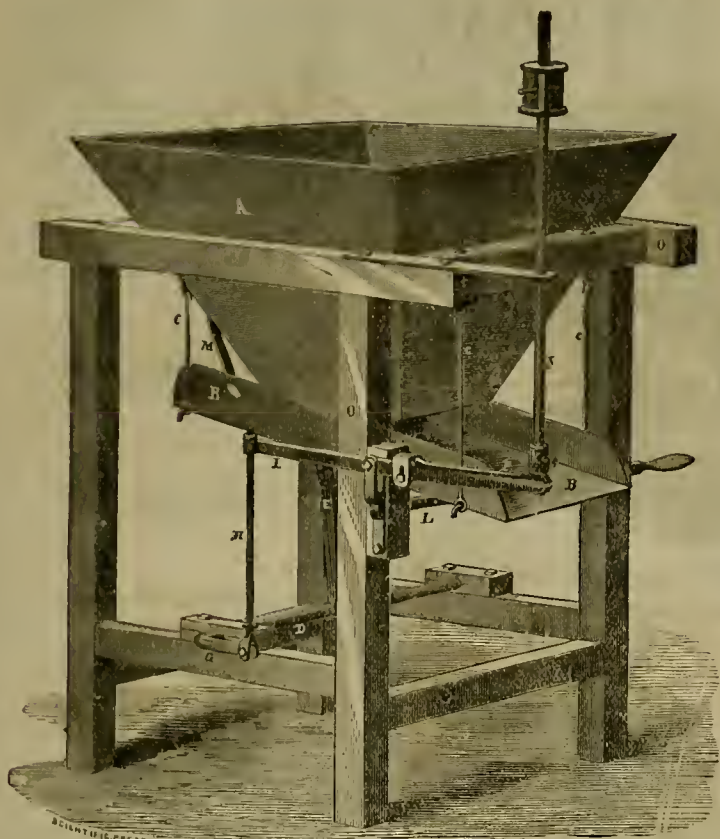
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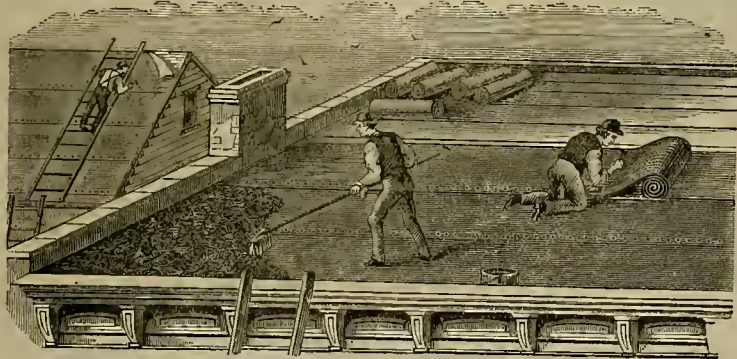
We append a few extracts from the many testimonials which we have received from mill men and practical mining men, of the effectiveness and positive action of the Tulloch Feeder. We do not depend solely upon these testimonials, as we are aware that testimonials are easily secured for almost any machine, but the high character of the parties certifying to those herewith given, will establish their value and genuineness:

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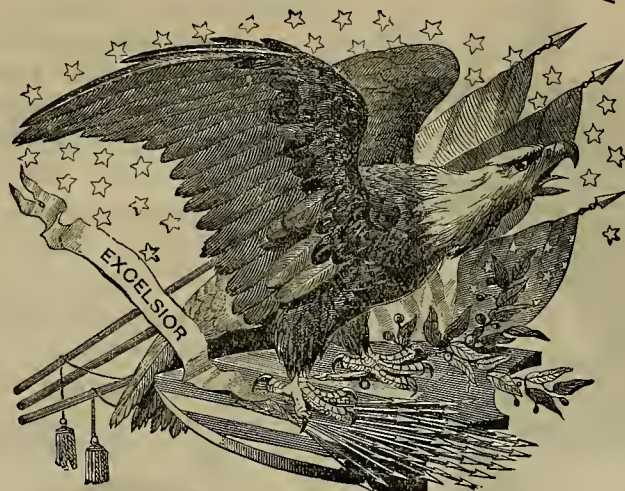
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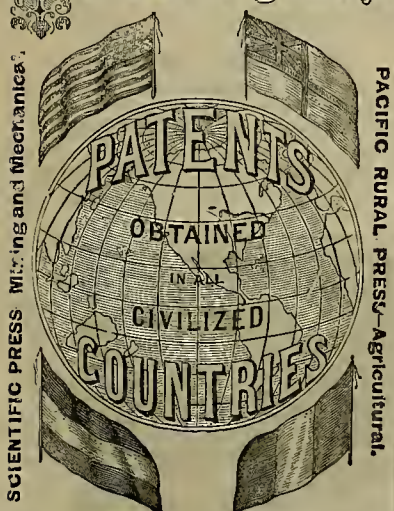
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APPRECIATION ABROAD.—We copy the following from the Mining and Monetary Gazette, of London, England: "We deemed it advisable, as affording valuable information to our readers, to publish in recent issues of The Gazette, the full text of the United States Mining Laws and Instructions, by the Commissioner of General Land Office, taken from our talented contemporary, THE MINING AND SCIENTIFIC PRESS, of San Francisco. The documents have now been issued in a handsomely bound volume by Messrs. Dewey & Co., the publishers of our transatlantic contemporary, and it will be found very useful to those already interested in American mines, and to others who may be tempted to embark in that enterprise in the States."

TESTING AND WORKING SILVER ORES.—This is the title of an illustrated work of 114 pages, for Miners and Prospectors, by Chas. H. Aaron, published by Dewey & Co. It is written for miners, in plain language, and with all necessary details in description. The author describes the different processes of roasting ores, the appliances, methods of testing ores, testing for a process, working samples, treatment of base metals, use of chemicals, leaching processes, different kinds of crushing apparatus, etc. This little work abounds with useful hints to miners and prospectors, and is written in a practical style. Price, post free, \$2.00. Address, Dewey & Co., MINING AND SCIENTIFIC PRESS, 224 Sansome St., San Francisco.

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# MINING AND SCIENTIFIC PRESS.

An Illustrated Journal of Mining, Popular Science and General News.

BY DEWEY & CO.,  
Patent Solicitors.

SAN FRANCISCO, SATURDAY, SEPTEMBER 15, 1877.

VOLUME XXXV.  
Number 11.

## An Improved Concentrating Mill.

Joseph Richards, of Battle Mountain, Nev., has recently patented, through the MINING AND SCIENTIFIC PRESS Patent Agency, a novel combination and arrangement of devices for sizing, separating, settling and treating ore pulp, in order to concentrate and grade the particles of ore preparatory to subjecting them to the reducing process. The invention, therefore, resolves itself into a milling operation, the object of which is the mechanical separation of the different qualities and grades of ore, and the elimination, before final treatment, of the gangue, or worthless portion of the ore. To those who are waiting to be able to utilize low-grade galena and copper ores, this process will prove valuable.

A concentrating mill of this character has been in operation some little time at the Copper Canyon mines, Battle Mountain district. Mr. Richards, the inventor, is superintendent of the mines there belonging to the English company, and has been quite successful with this method of concentrating.

The ore is first passed through a Blake rock breaker, and from this it is still further reduced by passing between a pair of Cornish rolls with a stream of 10 inches of water. By referring to the accompanying engraving, the operation will be understood.

A, A, represent two sizing boxes, which are mounted at one end of the mill structure, and into which the pulp and tailings are delivered by suitable spouts. These boxes are placed loosely inside of guides, b, b, and each one rests upon a suitable platform. A stem, C, is arranged to project upward from each box, and on this stem is a tappet, d. A cam, E, is secured upon a horizontal shaft, F, above each box, in the proper position to strike the tappets and lift and drop the boxes, in the manner of operating stamps in a quartz mill. Inside of each box two or more inclined screens, g, g, are secured, one above the other, each alternate screen being inclined in an opposite direction. The fineness of these screens is graded from the top down. An opening is made in the sides of the boxes at the foot of each screen, and a chute, h, leads from each opening down to an elevated tank, I, which is mounted on legs on the floor below. By inclining each alternate screen in an opposite direction, one-half of the chutes and one-half of the tanks, I, will be on each side of the sizing boxes. The pulp, therefore, which falls into the sizing boxes, will be secured by the upper screens, so that only the coarsest portions will be delivered into the upper chute and pass into the outside tanks. The second screen will separate a second grade, and its chute will direct it into the tank on the opposite side; and so on down, separating the grains according to their size, until the very fine portion, which is known as "slimes," passes off through a spout, j, at the foot of each sizing box, which conducts them to a series of settling tanks, hereinafter described.

The pulp which accumulates in the elevated tanks, I, is occasionally drawn off into a car, K, and conveyed by it along a track, L, to the opposite end of the mill, where it is dumped, in equal proportions, into two spouts, m, m. These spouts deliver the pulp into the concentrator, which consists of three tanks, n, n<sup>1</sup> and n<sup>2</sup>.

Inside of this middle tank, n<sup>1</sup>, is a plunger, p, which is connected by a pitman, with a crank shaft above, so that it is kept in continual motion. The outside tanks, n, n<sup>2</sup>, are connected with the middle tank by an opening at or near their bottoms, and a gate, q, is arranged to regulate the size of these openings. The spouts, m, m, deliver the pulp into the outside boxes, n, n<sup>2</sup>, in each of which is placed a screen, i. A quantity of water is admitted into these tanks, so that the action of the plunger causes the pulp to be thoroughly washed and separated from any fine portion which might have found its way into the tanks. That portion of the pulp which remains above the screens, i, i, is occasionally skimmed off and carried back to the spout, j, where it is mixed with the slimes and is subsequently treated with them, while the portion which settles through the screens is drawn off

through the doors or gates, q, q, in a clean condition, ready for subsequent treatment. Two sets of these concentrators and washers are employed, one set being on each side of the mill, and each set serves to treat the pulp which is taken from one of the sizers. Usually the inventor constructs boxes, n, n<sup>2</sup>, with overflow spouts, which carry off the skimmings, and thus render the operation continuous.

The slimes, which, as above stated, pass off through the spouts, j, at the foot of each sizing box, together with the settlings and washings from the concentrators, n, n<sup>2</sup>, which have been added to them, are conveyed by a series of troughs to a tank, t, into the bottom of which a stream of water is delivered through a pipe u, which leads from an elevated reservoir, v.

This upward-directed stream of water dilutes the pulp, and by its upward action carries the lighter portion of the slimes over the lower edge of the tank and through a spout on into a series of settling tanks, X, X, X. The first

tion already mentioned (German and English). This process is most admirably adapted to the concentration of all galena ores (as well as copper, which is the ore treated here).

"This is, without doubt, the most perfect and successful method of concentrating ores to be found. Its success is due chiefly to this operation of sizing; and one great advantage it has over the dry process of concentration is, that the rich ore can escape in dust. Chlorides and bromides when crushed are usually very fine, and much of the dust escapes in the atmosphere. But here scarcely any portion of the minerals escapes. After concentration less than two per cent. of the ore remains in the slimes, and even this small loss is due more to the carelessness of the workmen than to the inability of the process to save it." (See biennial report of the State Mineralogist, State of Nevada, 1875-1876.)

The concentrating mill referred to is running successfully, as shown by the above, near Galena, Lander county, Nevada, in charge of Capt.

process, which concentrates it at one operation. The slimes are most effectually treated by a very unique operation, which separates all grit and mud when both can be treated by huddles, etc., which are very simple in operation. The process is known as the wet concentration process.

All who have low-grade ores to work, and can spare the time, should visit these works, and the gentlemanly Superintendent, Captain Richards, will take pleasure in explaining the operation. No one who has not seen it can form a good idea of this simple but effective operation. We are informed that the cost of concentrating is from one to two dollars per ton. Capt. Richards will furnish any further information concerning it to those applying to him at the address given above.

## Items of Interest from the Mines.

We give below items of interest from prominent mines, most of which are collated from letters of the respective Superintendents on file at this office in this city:

In the De Freres mine, owing to the sides of the main shaft slacking and being dangerous, the Superintendent has commenced timbering. No water has yet been encountered in the mine.

The flow of water in the Gould & Curry main incline compelled them to suspend work until another pump could be put in at the 1800-foot level.

At the Chollar mine for the week ending the 8th inst., 509 tons of ore were mined, assaying \$22.25 per ton.

In the Hussey Con. mine they have started stopes from the winze, 230-foot level, and they are producing and looking well.

The water in this New York mine increases somewhat as sinking progresses, but not enough to impede work.

The Justice upraise has developed a fine body of milling ore.

The new incline pumps of the Silver Hill draws the water from the incline shaft very effectually.

We see by the *Eureka Sentinel* that the Tybo Consolidated mine has been shut down for the present.

The Gila stopes are turning out a large quantity of high-grade ore, and looking better than at any time since the commencement of the work.

The rich ore in the north drift, new ledge, 230-foot level, of the Hussey, is from 15 to 20 inches wide. The whole face of the drift is in ledge matter, chiefly quartz, intermixed with pay ore.

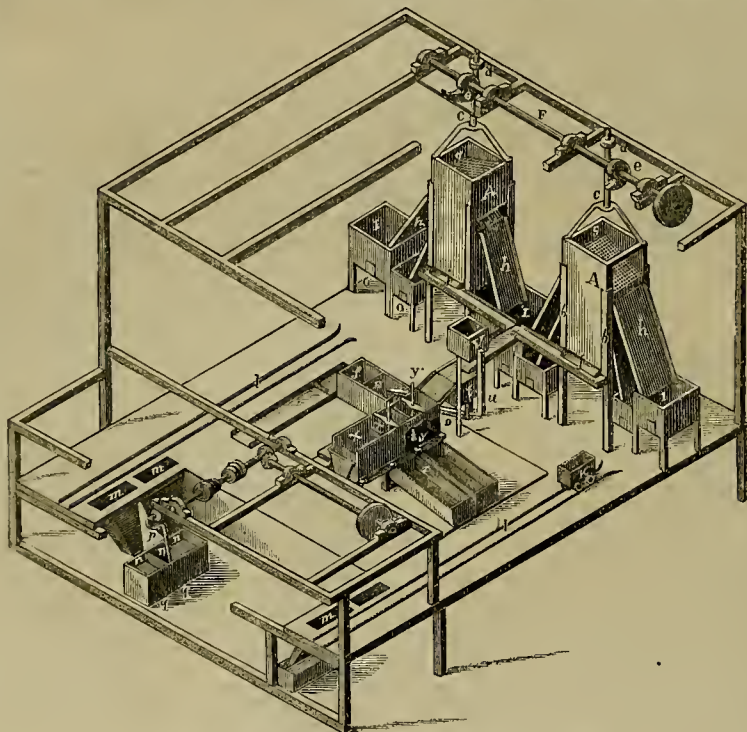
Connection between the 600-foot level and winze of the Leopard, has been made, and the stopes, from the 600-foot level up, are being opened. The mill is running to full capacity.

The shaft house of the Grand Prize mine was burned on the 10th inst., but the new mill was not touched, or the machinery of the shaft injured.

**COPPER EXTRACTION AT SPENCEVILLE.**—In an article in the PRESS, of September 1st, copied from the *Nevada Gazette*, the introduction of the methods of copper extraction practiced at present at the Spenceville copper mine, Nevada county, is attributed to the credit of Mr. Borger, the present Superintendent. We are informed that the methods of roasting, leaching and precipitation in revolving cylinders are the same now at Spenceville as introduced and applied under the direction of Mr. G. F. Deetken, some years ago (although not approved by him, at present, as the best method, in the light of recent experience). This correction is due to Mr. Deetken, we not being aware of the incorrectness of the assertion when published.

On the 10th inst. the hoisting works of the Grand Prize mining company caught fire beneath the blacksmith shop, and the building was rapidly consumed. The wind was blowing from the west, directly away from the mill, which escaped. Loss about \$7,000.

THE verdict of the Coroner's jury, in the case of the man killed at the Savage mine, in Virginia, censures the two engineers and the faulty construction of the dial connected with the reel.



RICHARDS' IMPROVED CONCENTRATING MILL.

10 settling tanks have each a hole in its bottom, in which a tapering plug, y, is secured. Each plug has a stem, y<sup>1</sup>, extending upward and passing through a cross-piece which extends across the top of the tank, so that the conical plug can be removed or lowered as desired, in order to adjust the size of the opening according to the quantity of pulp it is required to draw off.

The stuff which passes through these holes is received in inclosed tanks, z, z, below, in which the particles will settle to the lowest part in a properly cleansed and concentrated condition, leaving the lighter portions on top. The heavier portions of the slimes delivered into the tank, t, by the spouts, j, will settle down through a hole in the bottom of the tank and be conducted to a spout, D, into a tank, E, from which it overflows into a tank, f, in a fit condition to be subjected to the reducing process.

This system of ore washing, concentrating and sizing apparatus is nearly automatic in its operation, so that the ore is put in proper condition for treatment at a slight expense.

Mr. R. W. Whitehill, the State Mineralogist of Nevada, who spent considerable time at the works and in the examination of this machinery, in concluding his report of this invention, says: "The ore in the slimes or fine pulp, which in all cases is the most difficult to treat, is manipulated in a very unique manner here, and here is where Captain Richards has made the improvements in the methods of concentra-

tion, the inventor, and also the inventor of the "automatic huddle," described in our last issue, which is also used there. The whole of the machinery is moved by a 12x24-inch steam engine, which is of sufficient capacity to move a larger number of jiggers. The mill, we believe, has a capacity of working from 30 to 40 tons per day. The mines are beyond a spur of the Battle Mountain range, a mile and a half south of Galena, and are owned and worked by an English company, of which Capt. Richards is Superintendent. The mill is about three miles from the mines, where there is a good supply of water. This whole arrangement is of new design, and has been found to be a perfect success.

This concentrating mill was erected and started to work in the latter end of June, 1876, and has been in successful operation ever since. The ores treated therein have been low-grade copper ore, from six per cent. upwards. This ore is usually manipulated so as to bring five or six tons into one. The ore, after concentration, assays 30%—sometimes more and sometimes less, according to the grade of the ore worked. The ores are first crushed in a Blake crusher, and then by Cornish rolls to from one-half inch to one-twelfth of an inch in size, depending on kind and quality of rock; any other size for any other kind of ores may be found more advantageous. After the ores are crushed, the largest portions are made to undergo a jiggling



## Lead Ores.

## The Mining Situation in Utah.

The Salt Lake *Tribune* publishes the following results of interviews with several prominent citizens in that city on the subject of the general condition and future prospects of Utah: Joseph R. Walker, of the firm of Walker Bros., was the first gentleman whom we addressed, and from whom we elicited the following response to our questions: One thing is certain, that lead ores are being produced at a loss, on account of the great depreciation in the price of lead, caused by producing more than is consumed. This is not influenced by local causes alone, but is almost universal. The great depression in business in the East has, in this connection, much to do with our lead productions here. This metal, which enters so largely into the production of paints, piping, etc., is now a drug on the market, as compared with former years; very little building is going on, and consequently the amount produced for this branch of industry is allowed to accumulate in the hands of the producer and lead merchant. The uses to which this product may be diverted are limited, and, consequently, as the amount is increased the value is depreciated. The remedy is plain and certain, so soon as a revival in business ensues. To continue to produce this article, which is so abundant in our Territory, there must, of course, be a reduction in the rates of transportation to distant markets. At the present high rates of freight it is impossible for mine-owners, owning lead-producing mines, to ship their ores to any market and make anything. He fears that the railroad officials will not discover this fact until it is too late; when the miners who are running on such close margins will be obliged to close up their properties. If once shut down, it would be very difficult to reopen and work them again without a considerable expenditure to replace the timber which will have rotted, and bring the machinery again into operation. He considers the business of the year 1877, so far, as not at all discouraging, which he thinks will average a fair year's business. The agricultural industry is decidedly encouraging. Taking everything into consideration, Mr. Walker deems the outlook for business very fair, and much more so when compared with the status of trade in most places throughout the country.

## John Tiernan,

One of the first men who has manipulated mining property in this Territory, appeared to take a contented view of the situation. He is at present working several lead-producing mines in Bingham canyon, and, although his profits arising therefrom are not as large as he would desire, yet, under the prevalent condition of business of every kind all over the country, he thought we were rather fortunate out here. Of course, Mr. Tiernan is of the opinion that if a material reduction in the rates of transportation of our mineral productions could be brought about, it would cut the Gordian knot of dull times, and men who are working their properties at a loss and who will be obliged to discontinue shortly, would be willing to work them on the closest margins in the hope of eventually bringing about a better state of things. He said that the railroad corporations, by their exorbitant demand for transportation of ores and bullion, are injuring this all-important industry and enriching themselves. On the question of miners' wages, he thought that "the workman was worthy of his hire," and that skilled miners were getting little enough for their work.

There are many properties that could be worked successfully at the present status of wages, but the trouble was with the common carriers. For his own part, however, he saw very little cause for discouragement, and announced himself as quite well satisfied with the future of the Territory and her mineral resources.

We next called upon the manager of the Ontario silver mining company,

## Mr. B. C. Chambers,

And found him busy at his office. After waiting a few moments, we introduced the object of our visit, whereupon he gave us his views as follows:

He stated that his duties were chiefly confined to the Ontario property in Park City, which was not a lead-producing mine, and consequently he had not felt the decline in that product in any material degree. Still this fact did not prevent him from watching the course of events on the lead question, which he considered gloomy indeed. If things continue as during the summer, he feared that within the space of two months two-thirds of the lead-producing mines will have to shut down. Mine owners have met him on the street daily and told him that unless a change for the better occurs within a very short time, they will be obliged to close up business. The Eastern lead market was gorged and the production far in excess of the demand. Although he himself was paying competent miners good wages, yet he considered that a great saving could be made by a general reduction of wages and a more stringent, economical administration over the workings of these mines.

He believed that a material reduction in the price of labor could be made without injury, and a corresponding benefit to the country would soon become manifest. Let the laborer as well as the mine owner economize, and the benefit would be mutual. In the East labor is abundant and the demand for it small. His company was paying good wages to its workmen, for three reasons; first, it has the best

workmen; second, though the mine was healthy, it was wet and uncomfortable to work in; and third, it could afford it, while the low grade mines cannot. A strict economy was necessary to secure our mining industries from destruction and place them upon a more satisfactory basis.

## Dr. A. K. Smith,

Whose interests in mining properties are chiefly confined to the Leeds district, in southern Utah, said that the lead question did not affect mine owners in this vicinity, as that article does not constitute a part of the ores mined there. There is not a mine developed to any extent but what pays. The policy is to pay workmen good wages on the theory that good work is deserving of good pay. So far as his observations extend with reference to the lead-producing camps, he feared that a general cessation of work will shortly occur unless some remedy is discovered. Even those men who produce and smelt their own ores must stop for a time, until a better market is afforded for the lead product and a general reduction made in transportation. He believed that Dry canyon was the only camp that could afford to continue to work under the present circumstances, on account of the high grade of its ores. The loss on the shipment of base bullion to Eastern markets is too great to continue, and even that of refined bullion, on account of exchange and percentage, is made at a loss of 13 per cent. The doctor, however, was hopeful of better times.

We concluded our rounds with a visit to

## Mr. Richard Mackintosh,

Who considered it would be a good thing for the country if the mines would shut down, for the Eastern market was already overstocked with lead, and it has continued in this state for the past two years. He believed the intrinsic value of mining properties was great as ever, and that they would eventually prove treasures to their owners, but at present the great object was to work off and utilize the surplus product, and then the country would be in a better condition to make use of further supplies. Did not think that the rate of wages paid to our miners was too little or too great, but was amply sufficient to provide for their own and their family's wants with a good degree of comfort. He certainly would not close down any of his mines, although at present he was working them without much profit. He was satisfied with the future outlook.

There were several other leading mining men that our reporter called upon several times during the day, but was unable to find them. If some means could be devised among the owners of the mines producing a low grade of ores, and who could work on close margins, to form some combination among themselves for the shipment of their ores and bullion, the railroads would soon be brought to terms. At present it seems hopeless to expect anything of a conciliatory character on the part of the railroad magnates.

## "Outside" Mines in Nevada.

The *Virginia Enterprise* says: The stocks of the prominent mines of eastern Nevada are strong, nowadays, and seem to be favorites in the market. We look upon this as a healthy sign. Since the bonanza was struck it has been the hardest thing in the world to get men of capital to consider the great claims which eastern Nevada has for consideration. If a mine less than 60 feet wide was mentioned they would turn up their noses and look, if they did not say, "What's the use of bothering about a little thing like that!" The result has been hard on eastern Nevada, and very many of the men who, with a few thousand dollars, have confined themselves to Comstock stock speculations have lost their all, when, had they invested their money on some of the reasonable showings which have from time to time been made upon outside mines, they might have been happy now. By this we do not mean to cast discredit on the Comstock. It seems to us that about the cheapest mining stock stocks in the world today are those of the bonanza mines. But we would be glad if we could say something which would cause mining men to be fair to all mines. There are not many bonanzas in the world, but there are a great many small mines which, with prudent management, will yield as much money as any half dozen men ought to have. This State is full of such properties. In almost every district there are such mines. Bodie is a sample. It was worked years ago, imperfectly, and fell into disrepute. Last year a gentleman was in this city with a map of the district; he explained what had been done, and why the former trials were failures; and tried, in vain, to find some one with a little capital to investigate the matter, see if he was right, and, if so, to help put the district on its feet by the expenditure of a little money. For such expenditure he offered the lion's share of his interests. He could not get an encouraging word, much less any help. But this year two or three resolute men undertook to give Bodie a trial, and now Bodie looms up the coming camp; and, before this day a year, men here will pay for a few hundred shares of Bodie stock more than a whole mine would have cost them last summer. Tuscarora is another camp which, as a rule, mining men have ignored. When Grand Prize had one mill running and a second and larger mill nearly completed, with abundance of ore for both already developed, men here could not be persuaded to buy the stock at \$3 and \$5. Last evening it touched \$19, with an upward tendency. Another claim there which three months ago was for sale at \$15,000, is now sell-

ing at the rate of seven times that sum, and the stock is a first-rate buy, if the words of honest men and good miners can be relied upon. Three or four months ago Dr. Webber and two or three other gentlemen quietly bought a mine in Esmeralda county, and, building a five-stamp mill, have gone to work to make out of the ground a fortune. The promise now is that within a year they will get for their investment \$20 for one. Ike Bateman and his partners owned the Northern Belle for several years before any extensive work was done upon it. They tried to sell it for \$35,000. At last Mr. Bateman incorporated it, and sought to sell stock enough to build a mill. He tried for weeks in vain, until W. C. Ralston at last took it, more as an accommodation to Bateman than with a hope of gain. Since then the mine has not missed a dividend of \$50,000 per month for 26 months, amounting to \$1,300,000, with a prospect of continuing the same yield indefinitely. These examples show what can be done. White Pine, Elko, Nye and Humboldt counties are full of undeveloped mines. We believe the Pyramid district, in Washoe county, only awaits the application of a little pluck and money to make it a place where thousands of miners will find profitable employment. Some time, in this or the next generation, people will begin to realize something of the magnitude of the mining resources of Nevada.

## The Mining Situation in Arizona.

A correspondent of the *Arizona Enterprise*, writing from Alexandria, gives the following concerning the mining situation in Arizona:

Since I wrote you last I have made an extended trip through the mines of this section, and am free to confess that in no country have I seen such flattering prospects. The mines here, generally, are undeveloped, the deepest shaft in the district being only 300 feet, but so far as they are sunk upon they show finely. The owners are mostly poor men, who lack the means to open their claims, the want of reduction works being the great drawback to the mining interests of the country. Ore that will not go \$500 per ton will not pay to ship to San Francisco; and when freight, wharfage, storage and many other exactions which the owner has to submit to from the ring who control the purchase of ores, is added, but a very light margin is left for the hard-working miner.

It would naturally be expected that those men who have made money here, and whose every interest is linked with the destiny of the Territory, would lend a helping hand to the struggling miner in his efforts to develop the only real wealth of the country; the reverse is the case, however. To this there are one or two honorable exceptions. Coming here in early days, nearly all of them penniless, by taking advantage of exorbitant prices, and some of them of the follies and vices of their fellow-men, these enterprising (?) and thrifty citizens have gathered in a considerable quantity of the filthy lucre. The Government patronage in the shape of contracts, etc., was another rich lead which these patriotic and "truly loil" souls were not slow to take advantage of, and which they worked for all it was worth.

The men of broken fortunes, and those who never had any to break, who, under the assumed title of mining capitalists, have inflicted their presence on this community, have been another obstacle in the path of Arizona's advancement. Possessing neither cash nor credit, not overburdened with either honesty or honor, these specious gentry came here possessed with the idea that the owners of mines are ready to give away the fruits of years of danger and toil to the first smooth-tongued fraud who may ask for them. Several mines have been handed by these worthless, who, "by ways that are dark and tricks that are vain," have tried hard to follow honest Iago's advice to simple Rodrigo, sometimes at the expense of the owners; but thus far, though they have visited, examined and tested many mines in this part of Arizona, and made a devil of a pother generally, their immediate capital remains securely locked up in the vaults of California street, and they have yet to invest the first dollar in the mines of Yavapai county.

It is a fact that cannot be gainsayed, that mining at the best is somewhat risky—from its nature it cannot be otherwise. Mining sharps on this coast, however, are not disposed to take any risks. If a miner has a piece of property which is opened and shows beyond the possibility of doubt that there is \$50,000 in sight, then your California speculator (?), in the largeness of his heart, might be tempted to offer \$25,000 for it. This plan, it must be admitted, is a safe and sure one for the man of means, but it is hardly doing justice to the poor miner or prospector. I hardly think that many sales will be made on this basis.

The developments thus far made here have been accomplished by the persistent energy of the citizens of the Territory, and in this connection may be mentioned the Peck mining company, who, starting without means, have opened one of the finest mines on the coast. They are now busily at work preparing for the erection of a 10-stamp mill, which will open a new era of prosperity for the mines in this vicinity.

The town where I write from is the outgrowth of this mine, and already contains several stores, restaurants, boarding-house, etc., not forgetting numerous saloons. Arizonans, as far as my experience goes, are thirsty souls, which is owing, I suppose, to the dryness of the climate. All round about this region the sound of the

prospector's pick echoes from mountain and canyon, and this part of Arizona is being thoroughly explored. I have met here men who have prospected the coast from Cariboo to Chili. "The slings and arrows of outrageous fortune" have left their marks on many of them, and not a few are on the shady side of life, but they are still as light-hearted and buoyant as when they first began. Hope still repeats her flattering tale. Their sanguine spirits are proof against every disaster and disappointment, and when well primed with a generous quantity of the fiery fluid (here, by courtesy, called whisky), fortune smiles upon them; the rainbow hues of hope are brilliant with golden gleams, and they are still sanguine of "striking it." In nearly every instance, however, the original discoverer reaps but slight benefit from his find. Marshall, who found the first gold in California, a discovery which has in a manner revolutionized the globe, has had to earn a precarious existence by repeating the tale of the wonderful find throughout the cities of the Union; and the parsimony of a California Legislature refused him even a pittance in his old age. Comstock, the finder of the famous ledge that bears his name, which has added over \$300,000,000 to the solid wealth of the world, ended his days in privation and poverty, and not even a simple head-board marks the last resting place of the greatest of prospectors.

As I mentioned in my last, there is here a fine opening for men of means desirous of investing in mines. Ready cash, which most of the operators from the West are without, will accomplish much. Many very fine properties can be had at low figures; and, from the temper of the people, I am satisfied that the introduction of Eastern capital will be cordially welcomed, and every inducement offered for its successful investment. California operators generally handle mines for speculative purposes. This fact is well understood here, and the people are desirous of seeing the mining interests of the country in the hands of bona fide workers.

I repeat the time is ripe. The people are tired of the oppressions of the railroad monopoly and the exactions of the San Francisco ring, and will gladly welcome relief from any quarter. Once secure the mining interests, and the trade of the country will follow. It is a prize worth striking for. The Eastern people command the situation; it remains to be seen whether they will take advantage of it.

In regard to your inquiries as to the agricultural resources of this country, I will say that the lack of water will prevent Arizona from becoming much of a farming country. There are some good valleys in the southern part of the Territory, where fair crops are raised by irrigation; but the uncertainty of rains makes the calling of the Granger in this section a hard road to travel indeed. The future of Arizona depends on her mining interests. This is the corner-stone of her power and prosperity; everything else is secondary.

## Ward's Leading Mine.

The *Ward Reflex* says: There has been so much sameness about the work going on in the Paymaster, of late, that we have not thought it worth noticing. The work of taking out ore in the clay chamber has been suspended for the present, the ground being so soft that it was deemed advisable to timber it up securely before taking out any more ore. Sufficient ore is now coming out of the mine to keep six water-jacket furnaces running; but, unfortunately, the company has but two, and, we suppose, at two it will remain until sometime next summer. The company, it would seem, much prefer to pay the debt now hanging over it by levying assessments than to take it out of the mine. It suits the stockholders better, and, then again, some time between now and the close of the nineteenth century, they may begin to think of dividends. All that is necessary is to patiently wait. There is enough ore in sight to pay all debts five times over, but then it would be a pity to reduce it. Furnaces would be required and, possibly, mills. If the mill was started up, several thousand dollars would have to be invested in paus, and, possibly, it would take a week to get even on that outlay after it was started up. It takes money to run a mine, and that is one of the worst features; yes, and a mining man thrown in. The owners of the Consolidated Virginia or California would feel comfortable if a like body of ore, of equal richness, was exposed to view in either of those mines, and every effort would be put forth to take it out; but here it would be an impossibility to arouse the management from an ordinary snooze. A dividend of a million a month would be no inducement to wake up. Beyond question the Paymaster is the equal of any mine known or unknown, but sometime during the present year it is just possible to work out all above the second tunnel, which is all of 150 feet below the surface; and what sane man would think of going deeper, unless it were by a tunnel that would intersect the vein fully 100 feet deeper, even though it were necessary to run it 2,000 feet in order to reach that stupendous depth—a thing the mind of man is hardly able to grasp. The Paymaster has no equal in the State, in richness, at least, and is but little, if any, inferior to the Comstock in width; is, in fact, a wonderful mine, but is the worst worked mine the world ever saw. The manner in which it is worked is no less wonderful than the mine itself.



## MECHANICAL PROGRESS.

## The Value of Dry Steam.

J. Haug, a mechanical engineer, writes for the *Polytechnic Review* some points on the loss and danger of priming in boilers, and some ways of guarding against it. He says: The use of dry steam is not only a source of economy in this boiler, to prevent an unnecessary expenditure of heat, but still more so in the engine, where water contained in the steam not only does no work, but cools the metal in the steam cylinder, etc., thereby causing a fresh expenditure of steam to heat these parts up again. If with every pound of steam at 60 lbs. pressure a half pound of water is carried over, a quantity not unusual in a priming boiler, the latter has to be heated to the boiling point, and 7% of the heat is expended in heating the water carried over. The feed pump has, of course, 50% more work to do, and the heater will have its efficiency reduced by one-third.

"To avoid priming, a boiler should have a good circulation, and be large enough to do its work without forced firing. A good circulation will also improve the evaporative efficiency of a boiler, as the steam (which is a bad conductor of heat) is quickly removed from the heated plates, and now water constantly follows it.

A steam trap, either fixed in a steam dome, or in some high place in the steam pipe, will drain the water trapped in it back to the boiler, thus saving heat expended in heating it. Sometimes the steam pipe is extended downward from the throttle valve on the engine, so as to form a *cul de sac* for the accumulation of water, which can then be pumped back into the boiler. A superheater, heated by the waste gases, may serve to evaporate the water carried over, and to dry the steam thoroughly; but if the priming is excessive, it will not be sufficient for this purpose.

If water is carried into the cylinder, it will cool the metal, with which it comes in contact; the amount of this depends upon the surface exposed, the difference of initial and final temperature, the specific heat of the metal, the piston speed, the rate of expansion, etc.; and the variable character of these conditions makes it exceedingly difficult to give a figure for the loss thus incurred, but it is certainly considerable, and may range up to 30%.

In non-expansive engines this water is partly evaporated on the back stroke, abstracting heat from the cylinder increasing the back pressure, and in a condensing engine requiring more injection water and entailing more work upon the air pump. In expansive engines the re-evaporation of this water takes place during expansion, whereby the final pressure is somewhat increased, but this is vastly overbalanced by a great fall in the initial pressure; for engines using 60 pounds of steam, cutting off at one-sixth or one-eighth, the initial pressure on the indicator card may often be 20 to 30 pounds below the boiler pressure. Even a steam jacket would be powerless against a great influx of water, as its surface and rate of conduction are necessarily limited. Last, but not least, the danger of water in the cylinder must be considered, the result generally being broken pistons and rods, knocked-out cylinder heads, and, as a natural consequence, a general smash-up.

## Propelling by Pumps.

Attempts have been made at various times to move boats by forcing jets of water through openings in the sides or ends of the hulls, and hitherto these experiments have not been successful. A more recent experiment in this direction has resulted favorably, and a tow-boat, 13.11 meters (43 feet) long, has been constructed that employs a common steam pump in place of an engine and propeller. A writer in *Scribner's Monthly* gives the following details: The boat has a steam boiler of moderate size, and is, in other respects, one tow-boat of the usual pattern. Four pipes, 64 millimeters ( $2\frac{1}{2}$  inches) in diameter, are laid the whole length of the boat inside, and about a meter below the water line. At the bow two of these pipes open the whole size of the pipe directly into the outer water, and at the stern they are reduced to a nozzle of only 22 millimeters diameter. The other pair of pipes are arranged in the same manner, except that the nozzles are placed at the bows. A steam pump is connected with each pair of these pipes, and when at work takes the water in at the bows and ejects it in a powerful stream at the stern, and thus forces the boat ahead at a good speed. To reverse the direction, the pump takes the water from the stern through the other pair of pipes and forces it out at the bow, and the boat instantly reverses its direction. The novelty in this invention consists in the use of a reduced pipe or nozzle at the place of discharge. By means of the two nozzles the boat may be easily steered independently of the rudder by using one or the other of the two pipes alternately. The advantages claimed for this system of propulsion are the cheapness of the apparatus and the absence of ripple or disturbance of the water. The escaping water is so far below the surface that it creates no disturbance, and the boat only

makes the wave that breaks from the bow, and, in this respect, this method of propulsion may fulfill the demand for a steam tow-boat for canals. On a trial trip at sea, the boat made a voyage of some length in safety and at good speed.

## Pistons which Require no Lubrication.

In describing a form of compound engines for working steam of very high pressure, Mr. Loftus Perkins, in a paper read before the Institution of Mechanical Engineers, explained that he found some difficulty in getting ordinary pistons and valves to stand the high temperatures, or, to use his own language:

"In working these high pressures (350 lbs. per square inch) with great expansion, the ordinary mode of packing the pistons was found unsatisfactory, and to overcome the difficulty the compound piston was devised. The prevalent scoring and cutting of engine cylinders was effectively remedied by the discovery of the compound metal, of which the packing rings are made, which requires no lubricating material. Many cylinders fitted with piston rings made of this metal have been several years at work, and have been often examined, the cylinders showing no signs of wear, the wear taking place on the rings only, which may be easily and inexpensively renewed as required; and experience has proved that, with these pistons, the longer an engine is worked the more perfect does the surface of the cylinders become, and the less wear results to the packing rings. This metal for piston-packing rings is composed of five parts tin and 15 parts copper, and has since been used by several other makers for ordinary engines with great success. When this metal is used, no oil or grease is required to lubricate the cylinders—a great advantage, particularly when the engines are fitted with surface condensers."

Of one engine the writer says: "After being in use nearly 13 years, the piston-packing and valve rings, made of the special metal, were found in excellent condition after 18 months' working without lubrication since last examined."

## Our Domestic Metals.

Professor Thurston makes the following points in the *Popular Science Monthly*:

"This country has for years been importing cast iron, while domestic products of equal and even greater intrinsic value sell at a lower price. Other similar instances of unwisdom are cited by Professor Thurston, as, for example, the fact that we are importing boiler-plate at 11 cents a pound, when we can purchase American steel, vastly superior in all respects for the special purposes to which the former article is applied, at eight cents. Again, we import vast quantities of foreign steel tools, when at Pittsburgh and elsewhere we make steel fully its equal. In New England and Pennsylvania we have ores from which is made the finest cast-iron ordnance in the world. In Ohio we make a metal for car-wheels such as is never seen in Europe, and of such tenacity and elasticity that foreign engineers listen incredulously when it is described. Our Lake Champlain ores make an iron fully equal to Swedish for conversion into steel; and around Lake Superior and in Missouri we have deposits from which comes Bessemer metal, far superior to the phosphorus-charged metal we import. New Jersey supplies us with zinc which meets with no competition as a pure metal, and which can be used without purification, even for chemical purposes; and our native copper is absolutely free from admixture with injurious elements. It is time that these facts should be known, and that the people should disabuse their minds of the idea that, because a commodity is 'imported,' it is therefore of greater intrinsic value than a domestic product."

**BLASTING COAL WITH COMPRESSED AIR.**—With a view to facilitate the getting of coal without the use of gunpowder, Mr. Samuel Marsh, of Nottingham, proposes the use of compressed air in cartridges placed in direct connection with pumps, the pressure in such cartridges being increased until the explosion takes place. He also has a portable exploder, charged with compressed atmospheric air by the same machinery, which is then taken and connected to the cartridge. The cartridge, which is composed of iron or steel, in the form of a cylinder, is securely rammed or stemmed in; and when connected to the exploder the valve is opened, and the admission of air bursts the cartridge and brings down the coal. After the blasting operation is finished the exploder is unscrewed, and ready to be charged again.

**TOUGHENING GLASS BY COMPRESSION.**—In the Siemens' glass works at Dresden, there is now manufactured a product which has the same properties as La Bastie's tempered glass, the strength being communicated by the pressure of metallic rolls. Plates can be made, by this method, of much larger dimensions than by La Bastie's. They have a beautiful look, and can be ornamented with the most complicated designs, at a less cost than ordinary glass. Siemens claims that glass manufactured by his process has a greater strength than tempered glass, in the ratio of five to three. When broken it shows a fibrous structure, while La Bastie's is crystalline.

## SCIENTIFIC PROGRESS.

## Geological Progress.

We learn from a foreign exchange that MM. Delesse and de Lapparent have prepared a valuable resume of the geological works published during the years 1875 and 1876. Their work covers 184 closely-printed pages; we have room only for a few brief notes. The mean height of Europe, according to Leipoldt, is 296,838 meters; Humboldt's estimate was 205m. The increase of temperature at given depths below the surface, is greatest in the equatorial regions. Prestwich has confirmed the views of Dana, Carpenter and Wyville-Thomson, relative to the distribution of ocean temperatures. The resistance of rocks to crushing is diminished (in some cases as much as 80 per cent.) by the absorption of water. The plasticity of surface rocks is intimately dependent on their argillaceous character; but at great depths, pressure, water and increased temperature, make all rocks plastic. Th. Hubener has demonstrated, in a lignite, the existence of a multitude of microscopic quartz crystals, which he attributes to a slow decomposition of infiltrated silicates by the humic acid. By treating a Vesuvian pumice, which seemed to be amorphous, with fluorhydric acid, Fonque has extracted from it crystals of feldspar, pyroxene, amphibole, peridot, magnesian mica, and oxidized iron. He has also shown that the minute cavities of the pumice were decked with microscopic crystals of amorphous. The contest respecting the organic character of the *Eozoon* still continues; and even if its animal origin is granted, doubts are thrown on the assumed age of the Laurentian formation, in which it is found. Owen has studied the bones of a curious carnivorous reptile, *Cynodrakon major*, from southern Africa. He assigns it, together with other similar reptiles from the same region, to a new order, *Theoriodontes*, having the dentition of carnivores. He thinks that their high organization cannot be explained by the hypotheses either of Darwin or Lamarck. Forests improve the soil much more rapidly than coppice-wood; the humus exhibits a very different composition from that of the rocks upon the surface of which it is formed. Experiments with Treseca's apparatus seem to show that cleavage and lamination may be due to the same cause, and that the schistosity of gneiss may be no evidence of stratification.

## Insects' Breathing Apparatus.

In a recent work on the morphology of the tracheal or respiratory system of insects, reviewed by the *New York Independent*, Dr. J. A. Palmen arrives at the conclusion that the primitive number of pairs of spiracles or breathing holes in insects is eleven, thus agreeing with the views previously expressed by Packard in a brief essay published on the subject in 1873. Palmen's work comprises 150 pages, and is quite exhaustive, as a German essay should be. He believes that the tracheal system was at first, in its primitive form, open—i. e., consisting of a series of tubes connected by spiracles or holes with the outer world. In certain aquatic insects the system became closed, the larva breathing by external gill-like appendages. As to the origin of the tracheae Butschli (1870) believed that their mode of origin was the same as the silk glands, and that the two sets of organs were homologous, and that they were derived primitively from the segmental organs of worms, which are arranged in pairs along the body of the latter animal. In 1873 Packard suggested that the air-tubes may have originated independently within the body, and afterward formed a connection with minute pores leading through the skin. In 1874 Semper expressed the same views as those of Butschli, which in the year after was accepted by Mayer. Moseley regarded them in 1874 as dermal glands modified. Packard then suggested that the tracheal system might be derived from the water vascular system of certain low worms; while, in a late paper on the development of the Lepidoptera, Hantschke conceives that the air-tubes are derived from respiratory portions of the skin much enlarged. Finally Palmen appears to adopt the view that the tracheae may have originated from the segmental organs from the jointed worms. This shows how conjectural is our knowledge of the origin of these interesting organs. He conceives that the excretory function of the primitive lung-sac was afterward replaced by an absorbing function, and the sac or tube became a respiratory organ—viz., a trachea—which (at first simple and sac-like, due originally to an impushing of the skin) became longer and branched, until it assumed the present form. With this view we should not be disposed to find fault as a provisional hypothesis.

**COLORS OF MARS.**—In the observations about to be made of Mars at the time of its opposition, which occurs in this month, Professor Proctor thinks that it will be a favorable opportunity for a more careful study of the varieties of light and shade and of color in this planet. In comparing pictures of the same object made by different observers, great difference is apparent, and can be traced to this cause. The notion that the surface is divided into ruddy and green portions, and the white polar crown cape and occasional white cloud markings, is far from the truth.

## Why Mars' Moons were not Found Before.

Prof. Simon Newcomb writes to the *New York Tribune* in answer to the above question as follows: The answer is that Mars is now nearer to the earth than it has been at any time since 1845, when the great telescopes of the present had hardly begun to be known. The next opportunity for seeing them occurred in 1862, but we may suppose they were then not especially sought for with the two or three telescopes which alone would show them. The next favorable opposition was in 1875, but Mars was then so far south of the equator that it could not well be observed in our latitudes. The present opposition is about the best possible for observation in the middle latitude of our hemispheres, because the very smallest deviation from greatest possible approach to the earth arises from the opposition occurring a few days after the planet reaches its position, and this throws it farther north in declination than it would be at the time of absolutely nearest approach. The next opposition will occur in October, 1879, and there is some hope that the satellites may then again be observed with the Washington telescope. During the 10 years following they will probably be entirely invisible with all the telescopes of the world, because, owing to the great eccentricity of the orbit of Mars, the planet will be too far away at the times of opposition. In 1892 a favorable opposition will again occur. During the present year it is hardly likely that the satellites will be visible after October.

**A NEW METAL.**—Serge Kern announces, in *Comptes Rendus*, his discovery, in June last, of a new platinum metal which he calls *davyum*, in honor of Sir Humphrey Davy. It is hard, silvery in luster, malleable at red heat, readily soluble in aqua-regia and very feebly in boiling sulphuric acid, yielding a yellow precipitate with caustic potash. Sulphureted hydrogen, passed through a dilute solution of the chloride, yields a brown precipitate which becomes black upon drying. Potassic sulphocyanide, with the same solution, is colored red; and if the solution of *davyum* in KCyS is concentrated, a red precipitate is obtained. Sp. gr. 9.385 at 25° C. Kern thinks that in Mendeleeff's proposed classification of the elements, *davyum* is the hypothetical element placed between molybdenum and ruthenium, in which case its equivalent should be 100. It would then rank as the second confirmation of Mendeleeff's predictions, gallium having been the first. It is probably rare. The platinumiferous sand does not contain more than .00045 of *davyum*.

**THE HAYDEN SURVEYS.**—A telegram from Washington gives the following interesting information: James Stevenson, executive officer of Prof. Hayden's geological survey, has just returned from the field of exploration. Stevenson says that several divisions of the expedition are still at work and approaching the completion of their labor for the season. Each division has ten thousand square miles assigned it for examination, and reports just received from the seats of divisions indicate that they will finish their field work by the first of October. The result of this year's examinations will be equal in importance to that of any previous year. The work of survey in the present year will be in the Territories of Idaho, Wyoming, and Montana.

**A TELESCOPE IDLE.**—The mammoth telescope completed some two years ago by Alvan Clark & Son, of Cambridge, for L. J. McCormick, of Virginia, the reaping-machine manufacturer, still lies in the factory. This instrument has an object-glass of 26 inches, is nearly 20 feet in length, and was made for \$38,000 in gold. A portion of the cost only has been paid by Mr. McCormick; and the reason that he has never taken the instrument is said to be that he is unable to decide to which of the observatories and colleges that have begged for it he will give it. It is also understood that Mr. McCormick is in hopes of receiving a legacy to assist in paying for the telescope. In all probability, if the instrument is ever taken, it will be donated to some institution in Virginia, says the *Boston Transcript*.

**SANITAS.**—The oxidation product of turpentine (analogous, it is said, to the principle of the famous *Eucalyptus globulus*) discovered by Messrs. Kingzett and Ziegler, is now manufactured on a large scale for use as an antiseptic and disinfectant, under the name of *sanitas*. For proofs of its usefulness, says *Iron*, in these capacities readers may refer to the experiment detailed in the paper read by Mr. Kingzett before the Society of Arts. We have seen several instances of arrested putrefaction effected by means of *sanitas*, and intend further testing it. A variety of it is made for toilet purposes, and appears to be deserving of trial.

**GALVANIC CRYSTALLIZATION.**—The journal of the Russian Chemical and Physical Society, says *Nature*, contains observations, by Shidlovsky, on the microscopical crystallization of various metals under the influence of a galvanic current. The dendritic agglomerations of crystals form very speedily; their branches spread out from the cathode to the anode plate, vibrate on reaching it and collapse; this process is repeated till the space between the plates is filled with a spongy metallic mass. Each crystal has a characteristic ramification. The crystallization does not appear when the anode is gold or platinum.



THE connection between the Ophir and Sierra Nevada mines was made on the 7th inst., giving improved ventilation and increased facilities for drifting and prospecting. It is considered by miners as one of the most important connections made during the past year.



Continued on page 172.



# THE ENGINEER.

## Allowing for Rail Expansion.

This is a point in practical railway building which, we see, was quite thoroughly discussed at the late meeting of the Master Mechanics Association. In a paper by W. S. Huntington, the following table is introduced:

Length of rails, ft.	No. joints in a mile, one side of track.	Space for expansion, inch.	Fractions of an inch, decimally expressed.
15.....	352	.1026	1-84... .01562
16.....	330	.1090	1-32... .03125
18.....	293	.1228	1-16... .0625
20.....	264	.1363	1-8... .1250
21.....	251	.1434	3-16... .1875
28.....	183	.1914	1-4... .2500
30.....	176	.2044	5-16... .3125
36.....	146	.2465	3-8... .3750
40.....	132	.2725	7-16... .4375
			1... .1.0000

Among the reasons why it is best to be particular to have the rails the right distance apart at the joints are: If there is not room enough for expansion, the rails will tend to the form of a loop, causing death and destruction. And even if the compression is not sufficient to cause this, the effect on the track is destructive and causes breakages. If you are "out on the track" in a hot day, and the rails are "uncomfortably tight," and no trains in sight, you will be warned by the approach of one by the groaning and laboring of the track, as though it were a thing of life, and undergoing the most excruciating torture, or laboring like a ship in a storm at sea. The train may be two or three miles off, and out of sight, but you know it is coming by the snapping and cracking of the joints, as now and then a rail finds a little space and is thrust against its neighbor like a blow from a sledge. With this excessive compression on the rails and fish-bars, and the heavy rolling weight they are subjected to, the rails are strained and worked like a piece of tin bent back and forth between the thumb and fingers; and if there is a flaw or a weak spot it will soon amount to a crack and then break.

If the joints are left open considerably more than is necessary, the rails are soon spoiled and unnecessary expense incurred. And again, if more space is allowed for expansion than is necessary for very hot weather, that space added to that made by contraction in severe cold weather makes a considerable unnecessary space, which greatly shortens the life of the rails and fixtures. A track with the right space at the joints is worth much more than if laid hap-hazard.

## Improvements in Shutter Dams

Some recent improvements in France of shutter dams, worked by hydraulic pressure, have attracted much attention among engineers, the system comprising—first, a series of great wooden water gates, movable around a horizontal axis working in a cast-iron shoe secured to the floor of the dam; second, hydraulic presses applied on the down river side of the floor solidly anchored in the masonry and designed to work the gates—the piston of each press bearing a cast-iron cross-head working in slides, to which cross-head three rods are attached for communicating the pressure to a cross-bar fastened in the center of the movable gate; third, a series of copper tubes which puts each press in communication with the generator or reservoir of power destined to transmit water under the pressure of the hydraulic presses; and fourth, hydraulic works built on the abutment of the dam—these comprising a turbine with a vertical axis, a double force pump which receives motion from the turbine, and a reservoir of force. The pumps and the reservoir communicate with each other and with the presses by means of three-way cocks, which let the water either into the reservoir or into the presses, or empty it into a discharging tube. The maneuvering of the gates is effected by simply moving these cocks. By putting in communication each press either with the pumps or with the reservoir of power under a sufficient pressure, an ascending motion of the piston is effected, and in consequence the gate rises. By opening the cock into the waste pipe the water escapes under pressure of the gate, the "corps de presse" is emptied, and the gate sinks. The reservoir force is a regulator of the play of the pumps, and also permits the dam to be raised sufficiently, in case of need, to put the turbine in motion.

A FRENCH IRRIGATION SCHEME.—An important work of irrigation is in course of execution in the Department of Drome. The necessary legal concession for the prosecution of the undertaking was obtained on May 21st, 1874, and the works are now being vigorously pushed forward. The canal takes its origin from the Bourne, at a point about 200 meters below Pont-en-Royans, and is intended to supply water at the rate of seven cubic meters per second for the irrigation of 17,500 acres of land. It will consist of a principal canal in connection with a number of secondary channels carrying water to land in 24 different communes; and in case of need can be made to draw its supplies from two

further sources, one in the Lyonne and the other in its tributary, the Cholet. The Minister of Public Works has granted a subvention of 2,900,000 francs towards the expenses of the scheme, two-thirds of which sum is to be laid out upon the construction of the principal canal, while the remainder may be employed upon the secondary and tertiary branches. The works are progressing at such a rate that it is expected the principal channel will be completed considerably within the five years allowed for its construction, and it has become necessary to present a petition to the Chambers asking for the payment of the subvention before the date at which it was originally supposed the money would be first required.

NOT THE FAULT OF THE ENGINEER.—An Eastern exchange says: Destructive tornadoes occur in our Western States with sufficient frequency to be regarded as somewhat characteristic of certain regions. High table-lands in the interior of continents are more exposed to

## The Mole at Vera Cruz.

One of the interesting things about the construction of the new Mexican railway is the mole at Vera Cruz, by which connection is made between cars and shipboard. We read that the mole is built of iron, its length is 725 feet and its breadth is 60 feet at the end which stands in the sea. There are three tracks on the mole along the cranes, used for loading and discharging on the launches. The tracks then unite in one, connecting the mole with the station buildings, which are about 300 feet distant. The whole structure is divided into spans of 30 feet. The number of wrought-iron girders, including cross girders, is 150, resting on 76 cast-iron columns, driven into the rocky ground at a depth of 10 to 13½ feet. As the larger vessels cannot reach the pier, the company possesses two steam tugboats and five launches for their loading and unloading.



GREAT AMERICAN SHRIKE.

violence from winds than any other portions of the temperate zones. Of the extreme fury and strength of a tornado no conception can be formed by persons who have never seen its work. Against its power, if fully displayed, no structure of human hands can stand for an instant. There need be no surprise that the bridge over the Missouri at Omaha was torn to pieces when struck squarely by a tornado, nor does the fact reflect any discredit upon the bridge as a piece of engineering. Fortunately, visitations of this sort are comparatively unknown to dwellers this side of the Alleghenies, since the ranges of mountains back of the Atlantic coast check the violence of winds that sweep over the interior of the continent.

SAND IN SUEZ'S MOUTH.—It is estimated that the coast at the mouth of the Suez canal, at Port Said, is advancing outward at the rapid rate of about 50 yards per annum, and that the necessity for extensive dredging will be greater year by year. Not less than 937,000 cubic yards of deposit had to be removed in 1875, while the dredging of 161,000 cubic yards sufficed in 1871. The British government has ordered a new survey of the coast between Port Said and the Damietta mouth of the Nile, in order to ascertain the actual condition and the rate of increase of the sandbanks, and to see if any plan besides dredging can be adopted to check the growth of the obstruction.

There are five cranes placed at the extremity of the mole, four small ones for raising two tons each, and a larger central one which raises a weight of 20 tons. They are moved by a hydraulic apparatus of modern construction, in a perfect state of safety and order. The total weight of iron employed in the mole is 553.13 tons.

HUDSON RIVER TUNNEL.—It is the intention of the Tunnel Company, says the *Iron Age*, to begin work early in the coming fall. A shaft 25 feet deep has been dug at the foot of Fifteenth street, Jersey City, and this depth will be increased 20 feet. From this as a starting point, the tunnel will proceed in a northeasterly direction under the Hudson river and the Christopher street ferry slip. The entrance on the New York side will be in the neighborhood of Washington square. From Jersey City the grade will descend two feet in every 100 feet, until a point 2,700 feet from the New York side is reached, when it will begin to ascend at the rate of one foot in every 100 feet. The tunnel will be two miles in length, with a road-bed 23 feet wide, and two separate tracks. Through its entire length it will be lighted with gas. The wall will be constructed of brick, with a thickness of four feet. At no point will the top of the tunnel be less than 35 feet below the surface of the water, and in many places it will be 70 feet below. 120 laborers will be engaged in the

construction of the tunnel. The work will go on during the whole of the 24 hours, the force working in three relays, for eight hours each. Although the tunnel will be used for the conveyance of passengers, its main object will be the transportation of freight to and from the great railroad lines which terminate in Jersey City. The capital of the company is \$10,000,000.

## The Shrike, or Butcher Bird.

Our engraving shows a style of bird which many readers will recognize for it, or an allied species which is very common on this coast. It is the shrike, the terror of singing birds and of insects. The scientific name of the species shown in the engraving is *Lanius excubitor*, according to Wilson and Audubon. They build their nests in covered and secluded spots. These nests are often found on shrubs not above 10 feet from the ground, and generally in a fork at the top. They are as large as those of robins, and are composed externally of coarse grass, leaves, and moss, and internally of fibrous roots, over which feathers are placed. The eggs are four or five in number, of a dull cinerous tint, thickly spotted and streaked with light-brown towards the larger end. The period of incubation is 15 days. The young, so unlike their parents for a time, remain along with them, sometimes, indeed, even during the first winter. Caterpillars, spiders, and insects of various kinds form their first food, together with small fruits; but, as they grow up, their parents bring them the flesh of small birds, on which they feed greedily even before they leave the nest.

Possessing the faculty of imitating the notes of the sparrows and other birds, especially their cries of distress, they are believed to allure birds of these species and then seize upon them. One of them will alight upon its prey, strike it on the back of the head, which it thus breaks open, and, if not interfered with, will tear up the body, and swallow it in large pieces, with many of the feathers upon it. This shrike often pursues a turtle-dove or other bird a long distance on the wing, and eventually, by a single blow, cause it to fall to the ground. It is always active, courageous and persevering; and in winter, when insects and small birds are scarce in the Eastern States, at times it enters the cities, and attacks birds in cages, even flying through the open doors and windows in the pursuit. When caught with the hand, it pierces its little claws into the flesh and bites with considerable tenacity until choked off.

The flight of this bird is strong, swift and sustained, but not very elevated, being simply over the tops of low bushes. Impaling insects and birds on thorns is among its acts of cruelty; a habit it pursues without apparent motive, though some believe its design in this is to attract small birds to the spot, that it may seize and prey upon them. In this State it delights in impaling the large mole crickets, sometimes on the sharp points left by the pruning knife. We are told, also, of a case where six mice, alive and kicking, were transixed upon the sharp spines which surmount the leaves of the agave.

## Cornucopia District.

A correspondent of the *Silver State*, writing from Cornucopia says:

The mining prospects of this section are brightening every day. At Mountain City they have a 10-stamp mill running steadily, and, within the last week or 10 days, have shipped three bars of bullion, and have several more ready for shipment. This bullion comes from ore taken from the Mountain Laurel mine. Over in the Bull Run country, the Infidel mine, which I have mentioned before, is under the management of Mr. Meacham, and is developing well. I cannot give particulars, but I heard Meacham say, the other day, that in a short time he would have a splendid mine developed. Just north of town the Ruby Consolidated (Sullivan & Co's. claim) is being worked steadily. They are now down 60 feet and are drifting north on the ledge, getting very fine mineral. The ledge at this depth is about five feet in width, over half of it carrying ore that assays not less than \$260 per ton, and from that up to more than \$800 per ton. It is sufficiently developed to demonstrate that it is going to be the equal of any mine in this district or Tuscarora. The Panther company are now preparing to put up their hoisting works. Teams have gone after the machinery, and will have it on the ground in a few days, when the works will be erected as soon as possible.

The Hussey, during the last few days, on the 220-foot level, has been showing herself in her richest plumage. In her good humor she has presented her expectant owners with a solid and well-defined ledge two and one-half feet thick, which, on an average assay of the ore taken out across the ledge, and without any assorting, went \$269.36 cents per ton, and there is an immense amount of such ore. It is no small body, and men that have examined it say that it will excel the Leopard in its brightest days. Of the latter company's present works and prospects I cannot tell much, but there is an apparent move for the better somewhere in or about the mine—they are paying more promptly and putting on an increased force daily. In fact, all the leading mines now worked in the camp are largely augmenting their forces. No laboring man need be idle in this camp long if he is on the work. You can see that prospects are looking up here by the stock indicator. Cornucopia stocks are all on the raise. This place will be all right yet. |



## Tuscarora District.

We had the pleasure of meeting, says the Gold Hill News, with T. E. Atkinson, one of the principal owners and managers of the famous De Fries mill and mining company, at Tuscarora. Mr. Atkinson has just returned from a visit to that lively mining locality, where he has attended to the interests of his company, and he speaks very highly of the prospects and prosperity of the district and its mines. The Grand Prize is the leading mine, and is yielding splendidly at the present time. As compared with the Comstock, the vein is a mere stringer or feeder of a dozen feet or so in width, but the whole of it is very rich silver ore, which at or below the water level is of the white, free-milling Comstock character, such as comprises the richest portions of the bonanzas. At the 400-foot level, recently opened, the vein is eight feet wide and the whole of it from wall to wall is of the richest description. The mills are now running on ore from this mine, and turning out heavy shipments of bullion. Dividends will commence shortly.

The De Fries adjoins the Grand Prize on the same ledge, and without a doubt will soon be as prosperous a condition. The company have a new 14-stamp mill now in operation, and propose adding 10 stamps more, the whole to be run by water power, flowing from a living spring. This furnishes 150 miners' inches of water, even in the driest portion of the year, with an obtainable fall of 200 feet if desired, thus giving all the power and milling facilities required. Steam hoisting works are erected over the mine, and the shaft is down 215 feet, or to the third level of the mine. A fourth level will be opened, 100 feet deeper. In the first level, 40 feet below the surface, the ledge was found to be only two feet wide; at the second level, 113 feet below the surface, it was six feet wide, and on the third, or present lowest working level, it is 10 feet wide. This ledge has proven to be richer in proportion as depth and width have been attained, assaying at the second level as high as \$528 per ton. Very little, however, has been done as yet in the way of stopping and breasting out the ore, about 1,500 tons in all having been extracted thus far in opening out the mine. This, without assorting, will probably average nearly or quite \$30 to the ton, and go much higher by assorting. To crush this ore at their water mill will cost \$10 per ton, including hauling (seven miles), for which \$2.50 per ton is charged. The water power of the company is called worth \$50,000. With this water power they have 320 acres of land.

The Navajo, Young America, Independence and Hornet are among the most prominent of the neighboring mines. The Navajo company are down 85 feet, and have a ledge four feet in width. The ore is very rich in born silver, chlorides and bromides. The Young America ledge is small, only about two feet in width, but is rich in gold, gold predominating in the ore. The Independence company have let a contract for the erection of a 10-stamp steam mill. They have not yet attained any considerable depth on their lead. The Hornet company have a good ledge, but also have a great deal of water to contend with at present. This water, however, comes from the surface, and they will presently have no trouble with it. At the depth of 215 feet the De Fries company have no water.

The various ledges upon which these companies are located do not run parallel with each other, but seem to concentrate toward the center of the steep hill to the northward, beneath whose high peak might be the grand reservoir or fountain head of them all. The owners of these ledges and mining claims all feel rich, and everybody looks forward to a prosperous future.

## Bullionville.

The editor of the Pioche Record has been on a trip to Bullionville, and says it now has the appearance of a pretty lively camp, although a small one. The limited number of business men that are there express themselves as well pleased with their present business and the future prospects of the place. The Raymond & Ely 30-stamp mill had the 18 pans and eight settlers all at work on tailings, the ore cars being so constructed as to run down into the tailing pit, load up and return with a supply of the tailings for the pans. The supply seems to be inexhaustible. The tailings are worked with much more satisfaction now than on the first start, the bullion also being of a much finer quality. The blacksmith and repair shop of this company is particularly occupied in fixing ore cars and other paraphernalia about the mill. The concentration works of Hugh White were in full blast, doing good work and concentrating many tons of tailings during the day. The concentrations are very heavy, giving evidence of considerable metal. A visit to the smelting furnace disclosed the fact that it was not then running, but the large amount of charcoal, iron ore and tin cans gathered around, showed that every preparation was being made for an early start. The Alps, or American Flag mill, was going to its full capacity, under the charge of John Collier, five stamps being about to run on custom ore. Several parties having custom ore at the mill for crushing, were waiting anxiously their proper turn to take battery samples. Ore at the Raymond & Ely mill is accumulating rapidly, preparatory to starting the batteries on it. The 20-stamp mill is at present engaged in pumping up water for the mill, etc.

## USEFUL INFORMATION.

## The Average Height of Men.

The Druggists' Circular, in noticing the questionable statement "that we are becoming a degenerate race," discusses the tables prepared by Dr. Baxter from the records of the Provost Marshal General's Bureau, made during the civil war. These examinations were made during the latter part of the war, after the finest fighting material had been enlisted, consequently these statistics do not overestimate the average development of the American people. From the tables of Dr. Baxter and those of Mr. Gould, gathered by the Sanitary Commission, the Indians are shown to be a tall race. In the comparison of States the Indians would rank as high as the ninth, though it is curious to see that they head the list of nationalities.

Here follows the table showing the superiority in stature of 501,068 men of the various nationalities—185,448 foreigners, three-fifths of whom were from Germany and Ireland—the former having a few thousand more than the latter:

NATION.	MEAN HEIGHT IN INCHES.	NATION.	MEAN HEIGHT IN INCHES.
1. U. S., Indians.....	67.931	14. Wales.....	68.418
2. U. S., Whites.....	67.672	15. Russia.....	68.393
3. Norway.....	67.465	16. Switzerland.....	68.381
4. Scotland.....	67.060	17. West Indies.....	66.307
5. British America.....	67.014	18. France.....	66.271
6. Sweden.....	66.896	19. Poland.....	66.211
7. Ireland.....	66.741	20. Mexico.....	66.110
8. Denmark.....	66.648	21. Italy.....	66.000
9. Holland.....	66.637	22. South America.....	65.839
10. Hungary.....	66.584	23. Spain.....	65.823
11. England.....	66.577	24. Portugal.....	65.432
12. Germany.....	66.539		
13. U. S., Colored.....	66.531	Mean of total.....	67.300

Graded according to the mean stature of the inhabitants (American born whites), the different Northern States stand as follows:

NATION.	MEAN HEIGHT IN INCHES.	NATION.	MEAN HEIGHT IN INCHES.
1. Kentucky.....	68.077	14. Maryland.....	67.814
2. Kansas.....	68.551	15. Ohio.....	67.833
3. Minnesota.....	68.371	16. Vermont.....	67.833
4. Missouri.....	68.337	17. Delaware.....	67.490
5. California.....	68.307	18. Pennsylvania.....	67.430
6. Nevada.....	68.286	19. Dist. of Columbia.....	67.353
7. Indiana.....	68.080	20. Rhode Island.....	67.290
8. West Virginia.....	68.002	21. New York.....	67.274
9. Wisconsin.....	67.911	22. New Jersey.....	67.023
10. Maine.....	67.895	23. New Hampshire.....	66.929
11. Iowa.....	67.871	24. Massachusetts.....	66.951
12. Illinois.....	67.835	25. Connecticut.....	66.587
13. Michigan.....	67.826		
		Mean of total.....	67.672

## Lace Paper.

The manufacture of what is called lace papers is an important branch of trade in Germany, and even in these times of general depression has maintained its activity. The uses of these papers are exceedingly various; it is the general custom in Germany to decorate ceilings, fireplaces and the like with them, while confectioneries, bouquets, etc., are put in gay-colored wrappers.

The great difficulty in manufacturing these papers, says the *Paper Trade Journal*, is to produce a surface which will exhibit, as in real lace, the fine gradations of lines. Small lead hammers are used for punching on stamps. The holes and edges of the desired pattern are raised on the stamp, and the paper being laid on it is hammered until the hollow surfaces project on the other side.

The paper must be uniform in strength and sizing, and also in color, or it will appear as if composed of different kinds. As it frequently happens that the edges of the sheets are not equally pressed, care is taken to avoid any folds or creases in the middle. From two to four sheets are stamped at a time, and unless they have been rubbed with talc they must be closely pressed together. Some manufacturers have the stamping done in penal institutions, but the advantages of this, if any, are not very apparent. The appearance of this paper is very much improved when the sheets are pressed, the impression being much clearer, but for most purposes this is not usual. For bouquets card paper must be used, and the center replaced by pasting a piece of glazed card so as to form the funnel; but previously a cross must be cut out of the center so as to admit the stem of the bouquet. Some of these bouquet-holders have from 12 to 24 plys, and are made in imitation of ferns, etc. There are some 50 manufacturers of these *papiers de luxe* in Berlin, and they are now introducing them for various ornamental purposes—as borders to chromo-lithographs, etc., and bringing them out in colors.

ROOFING STREETS AND COOLING HOUSES.—The *Celestial Empire*, published in Shanghai, China, offers some suggestions, says the *Iron Age*, that might be of value on this side of the globe, as the temperature which calls forth the remarks is not higher than that of most American cities in midsummer. The Chinese practice of roofing their streets in hot weather with a temporary covering of matting is spoken of in terms of high approval. Streets thus shaded are said to furnish a most agreeable arcade. It is further suggested that the air beneath the matting might advantageously be kept in motion by out-door punkahs. Indoors there are plenty of inventions for warming houses, but very few for cooling them. What a delightful convenience it would be, for instance, to be able, by merely turning the button of a register, to let a cool wind pour into a room at any moment! Must we wait till the next generation introduces the latest improvements before we can have both hot and cold air, as well as hot and cold water in our houses?

GALVANIZING IRON.—Molesworth gives the following directions for galvanizing iron—coating iron with zinc. The directions are very explicit and will be found valuable by many of our readers who have, from time to time, asked questions in regard to this kind of work. Pickle the article six or eight hours in water containing about one per cent. of sulphuric acid, held in wooden vessels; the acid requires to be renewed from time to time, according to the quantity of iron pickled. After pickling scour and wash well in clean water. Keep the article under clean water (in which a little fresh burnt lime has been stirred) until ready for the next process. Immerse in chloride of zinc for one or two minutes until a skin of fine bubbles is formed on the surface. Chloride of zinc may be formed by saturating hydrochloric acid with metallic zinc until effervescence ceases, then decanting and adding a little sal-ammoniac. Dry the article on a heated iron plate, then immerse it in a bath of molten (not glowing) zinc until it acquires the temperature of the zinc bath. The surface of the molten zinc should be protected by sal-ammoniac, or some other substance. In some cases there is a partition at the surface of the bath, one portion of the surface being protected with sal-ammoniac, the other with a layer of charcoal. Beat the article while hot, to remove the excess of zinc.

ADULTERATION OF BEESWAX.—The recent adulteration of yellow beeswax with resin has led to the invention of a new method for its detection. E. Schmidt recommends the following process for the rapid and accurate detection of relatively small quantities of pine resin. He heats five grammes (75 grains) of the wax to be tested in a flask with four or five times the quantity of crude nitric acid, specific gravity 1.31 to 1.33, until it boils; and it is kept boiling a minute, then an equal volume of cold water is added, and enough ammonia (which must be added very cautiously) put in and shaken to cause it to smell strongly of ammonia. The alkaline liquid is decanted from the precipitated wax into a cylindrical vessel. If the wax is pure the liquid will have a yellow color; if the wax is adulterated with resin, the liquid will have a more or less intensely reddish-brown color from the formation of nitro-products. This being a colorimetric test, it is well to have some perfectly pure wax for comparison. The reaction is much more violent during boiling if resin is present. As little as one per cent. can be detected in this way.

WATERPROOF LEATHER.—Melt one liter of boiled linseed oil, 125 grammes of suet, 46 grammes wax, and 32 grammes resin together over a slow fire, and apply it to the leather with a brush while warm. This composition keeps the leather very soft. The English fishermen have long been using it. They can remain in the water for hours ere it penetrates through the leather.

BLAST FURNACES IN THE UNITED STATES.—A statement compiled by the *Iron Age*, reports that there are 704 blast furnaces in the United States, of which 270 burn charcoal, 208 bituminous coal or coke and 226 anthracite coal. Of these, 87 charcoal, 85 soft coal and 87 anthracite furnaces, 259 in all, are in blast, leaving 445 idle.

EBURITE.—A new material called eburite, apparently capable of extensive employment in the arts, is made in this way: To the dust of bone or ivory, gum tragacanth and any suitable coloring matter are added. The whole is then pressed. Sometimes a very intimate union is formed between the particles of bone or ivory by heat and pressure without any gum.

## GOOD HEALTH.

## Hints on the Care of the Eyes.

There are, perhaps, more individuals who ascribe their weakness of sight to a use of their eyes under an insufficient artificial illumination than to any one other cause. In a great many instances this may not be strictly true, but there can be no doubt that faulty artificial light is one of the most productive causes of a certain class of injuries to which the eye can be exposed. The two sources of trouble with the ordinary artificial lights are—first, they are not pure white, and secondly, they are unsteady. The first defect is found in all artificial lights except the lime, electric and magnesium lights; the second especially in candles and gas. The yellowness is, in a measure, counteracted by using, in the case of lamps and gas, chimneys of a violet or blue tint, and the flickering of the gas may be obviated largely by employing an Argand burner. All things considered, a German student-lamp furnishes the most satisfactory light. The next best is gas with an Argand burner. The chimneys of both may, as above suggested, be advantageously of a light-blue tint.

The position of the light in relation to the body is of great importance. If a shade is used on the lamp or burner (it should, by preference, be of ground or "milk" glass, never of colored glass), the light may stand directly in front of the body and the work be allowed to lie in the light under the shade, which will protect the eyes from the glare of the flame. If no shade is used the back should be turned to the source of light, which ought to fall over the left shoulder.

The same rule applies in the management of daylight. In this case the light should come from behind and slightly above, and fall directly on the work, whence it is reflected to the eye. It should never fall directly in the face.

The light in the room during sleep is also not without its influence. As a rule, the room during sleeping hours should be dark; and, in particular, care should be taken to avoid sleeping opposite a window where, on opening the eyes in the morning, a flood of strong light will fall on them. Even the strongest eyes are, after the repose of the night, more or less sensitive to the impression of intense light. The eyes must have time to accustom themselves to the stimulus.

Attention should be called to the injurious effects that follow reading on railroad cars. On account of the unsteadiness of the page, reading, under these circumstances, is exceedingly trying to the eyes, and should never be persisted in for any considerable length of time. During convalescence from severe illness the eyes are generally the last to regain their lost power.—*Dr. S. M. Burnett, in Scribner.*

## Pickles Colored but not Poisoned.

Picklemakers have for a long time had to fight their consciences by "greening" their product by heating in copper vessels, or by introducing copper salts. The French chemists claim to have done away with the use of copper by substituting a preparation of chlorophyll, which is the substance forming the natural green in plants. The matter was brought before the Academy of Sciences in Paris, recently, and a paper read, the purpose of which was to establish the fact that the salts of copper can be advantageously replaced in all particulars by the exclusive employment of chlorophyll obtained from edible vegetables—a conclusion which is based upon the following observations, which we obtain through the *Polytechnic Review*:

1. The chlorophyll of the vegetables disappears during ebullition.

2. The vegetable fiber and the starchy matter which is contained, when brought in contact with chlorophyll during ebullition, almost completely saturate themselves.

3. The vegetables when but half saturated with chlorophyll during the operation of bleaching retain this beautiful coloring matter.

These facts are of great importance, and indicate the mode of procedure which is to be adopted. If some spinach, or still better, the foliage of leguminous plants be treated with caustic soda, a liquor is obtained which gives, with alum, a lac of chlorophyll. This lac should be carefully washed to free it from sulphate of soda. This lac is easily dissolved by means of an alkaline phosphate or alkaline earth, and is composed of chlorophyll, alumina and phosphate of soda. This dissolved lac is added to the bleaching water, and on ebullition yields up its chlorophyll to the vegetables. Several flasks of peas prepared by this process were presented to the Academy; of these, those that were completely saturated with chlorophyll possessed a shade of color impossible to be obtained by the use of copper; besides, they were devoid of the astringent taste, as well as the poisonous effect, which characterizes those preserved by means of the salts of that metal.

Although the application of the French discovery, as described above, can be made only by one skilled in the handling of chemicals, there can be no doubt that ere long so important a matter will be put forth in more popular form.

## Healthful Hours.

When the days are hot and the nights cool, says *Hall's Journal*, there are periods of time within each 24 hours when it is safest to be indoors, with doors and windows closed—that is to say, for the hour or two including sunrise and sunset—because about sunset the air cools, and the vapors, which the heats of the day have caused to ascend far above us, condense and settle near the surface of the earth, so as to be breathed by the inhabitants. As the night grows colder these vapors sink lower and are within a foot or two of the earth, so they are not breathed. As the sun rises, these same vapors are warmed and begin to ascend, to be breathed again; but, as the air becomes warmer, they are carried so far above our heads as to become innocuous. Thus it is that the old citizens of Charleston, S. C., remember that, while it was considered important to live in the country during the summer, the common observation of the people originated the custom of riding into town, not in the cool of the evening or of the morning, but in the middle of the day. They did not understand the philosophy, but they observed the fact that those who came to the city at midday remained well, while those who did so early or late suffered from it.

All strangers at Rome are cautioned not to cross the Pontine marshes after the heat of the day is over. Sixteen of a ship's crew, touching at one of the West India islands, slept on shore several nights, and 13 of them died of yellow fever in a few days; while of 250, who were freely ashore during the day, not a single case of illness occurred. The marshes above named are crossed in six or eight hours, and many travelers who do it in the night are attacked with mortal fevers. This does at first sight seem to indicate that night air is unwholesome, at least in the locality of virulent malaria; but there is no direct proof that the air above sunrise and sunset is not that which is productive of the mischief.





B. EWER, SENIOR EDITOR.

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Our latest forms go to press on Thursday evening.

SAN FRANCISCO:

Saturday Morning, Sept. 15, 1877.

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## The Week.

The week has brought forward nothing of special importance in connection with the mining interests. The Sutro tunnel, as it gradually nears the Comstock lode, is a subject of considerable discussion. It is expected that there will be some difficulty in effecting an arrangement to suit both the tunnel people and the owners of the mines, as far as the royalty is concerned. A committee of mine owners has the matter under consideration, however, and the result will soon be made known.

The week brings to us the opening of the fair season in the interior. The Mechanics' Institute fair in this city has proved such a complete success, and the demand of the populace is so clear, that it will be continued through another week. This, however, will not interfere with the reign of the State fair at Sacramento, which will be inaugurated with due ceremonies next Monday. Indeed, we shall not be surprised if this contemporaneous existence of the two fairs will prove an accommodation to many visitors up and down the coast for they can visit the Mechanics' fair on their way to or from Sacramento, and thus enjoy the two exhibitions by one absence from home. As we have said from time to time, on the authority of the Sacramento papers, the prospect for this State fair is bright, and we trust no one there present may have the least cause to remember that the present is a dry year.

The failure of Frank Leslie, the newspaper publisher, is announced. Liabilities, \$330,000.

## Tailings.

Peoples have found out, within the past few years, that it is sometimes more profitable to work over tailings which have been hurriedly or carelessly put through the mills, than it was to work a mine and mill the ore as it came from the mine. The tailings, after lying exposed to the weather for a year or more, are much more easily worked, as the sulphurets decompose and the mass becomes much more tractable. A good creek or gulch full of tailings is now often worth more than the original mine, and people have made fortunes working these beds.

Near the Comstock there are several tailings mills at work. At first they did pretty well, but when quicksilver went up so high, they had to give up for a while. Now the tailings mill, at the junction of the Seven-Mile and Six-Mile cauyons, is running night and day on the tailings and slum from the bonanza mills in Virginia City. Employment is given to between 75 and 100 men. The Gold Hill News describes the process as follows: The slum has to be thoroughly dried before working. During the summer months it is spread out upon the ground and exposed to the sun for several weeks. It has to be turned and handled a number of times before it is ready for the mill. This requires a great deal of labor. When winter comes, with its snows and rains, the sun-drying process is not available, and were not some other means adopted, the supply of workable slum would soon be exhausted, and work at the mill would necessarily close for the season. To obviate such a step, a drying machine has been constructed at the Union foundry, and is now being placed in position at this mill. It is a home invention, and the inventor thinks it will have capacity enough to keep this mill in active operation. It has not yet been put to a practical test. If it is found to do its work readily and well, as is expected, it will be used winter and summer, as the cost of fuel to run the dryer would be but a trifle compared with the money it takes to employ men and teams to haul and handle the slum by the out-door method. The mill has a crushing capacity of over 200 tons per day. The slum is worth about \$30 per ton, enough to make this working of the mill quite profitable.

## Notices of Recent Patents.

Among the patents recently obtained through Dewey & Co.'s SCIENTIFIC PRESS American and Foreign Patent Agency, the following are worthy of mention:

**SPRING FLOOR.**—Wm. H. Clark, Austin, Nev. This invention relates to a spring floor, which can be formed on a solid foundation in such a manner as not to affect the standing walls of a building. It consists of a supplemental floor, placed over either an ordinary floor or the beams upon which floors are usually secured, having springs beneath the supplemental floor, which are so arranged that an even elasticity will be given to all parts of the floor. This floor is claimed to be safe and durable. If desired, the spring floor may cover only a portion of a room, a stationary platform being built up even with it so that a level surface will be presented, the stationary part being used for seats, music stand or any desired purpose.

**DEVICE FOR HOLDING SACKS FOR FILLING.**—J. L. Covert, Modesto, Stanislaus county. This is a novel device for holding sacks when being filled, the construction being such that any sized sack can be instantly adjusted when empty and released when full. Mr. Covert has employed in practice 10 of the holders, side by side, and having a tilting spout between them, by which they could be alternately used.

MR. E. M. DENNY will visit Oregon and adjacent Territories in the interests of the MINING AND SCIENTIFIC PRESS and PACIFIC RURAL PRESS, and will correspond for both papers. We have noticed Mr. Denny's correspondence in the Tulare county papers, and are sure that the notes he gathers will be of interest to our readers. We hope our friends in the regions he visits will assist Mr. Denny as much as they can, and show him such favors as are in their power.

THE County Commissioners of Storey county signed a contract with Lewis & Deal and Jonas Selsky to act as their attorneys to prosecute the back bullion tax suits, for the recovery of taxes due Storey county from 1868 to 1875 inclusive, amounting to about a million dollars. According to a dispatch published in one of the morning papers, the prosecuting lawyers are to receive from Storey county a 20% fee.

THE mint, at the request of the Treasury Commission, commenced to run, Thursday morning, at its maximum capacity for one week, excepting the refinery. The necessary amount of refined bullion has been procured to keep the mint in active operation, and the consumption of coal during the next two weeks will be carefully noted by Mr. Eckert, who has been selected for that purpose by the Commission.

By a collision between two vessels in the English channel, this week, 96 lives were lost.

## The Bullion Tax.

The Decision of the U. S. Supreme Court that it is Valid.

The suit of Charles Forbes, appellant, vs. Thomas Gracy et al. (appeal from the Circuit Court of the United States for the District of Nevada), has been decided by the United States Supreme Court. This was a suit brought by the appellant to enjoin the Collector of Taxes of Storey county, Nevada, from collecting the tax imposed by the law of that State upon the property of the Consolidated Virginia mining company, appellant being a stockholder in that company and an alien, a subject of the Queen of Great Britain. The tax is imposed upon the proceeds of a mine worked by a corporation, and is resisted on the ground that the title to the land from which the mineral is taken is in the United States, and is not, for that reason, liable to State taxation. The case, says the judge delivering the opinion, is prepared and submitted to the United States in printed argument in the very last days of the term, and we are urged to decide it on the ground that it involves a question of vast interest to all mining operations in the Pacific States, and is of vital importance to the State of Nevada, as it affects

## Her Largest Source of Revenue.

In view of its importance, then, we should postpone a decision until the next term, if the questions presented were over-doubtful or difficult of solution. We think very few words—all we can give to this subject at this late day—will show that it is neither. It is very true that Congress has, by her statutes and tacit consent, permitted individuals and corporations to take out and convert to their own use ores containing precious metals which are found in lands belonging to the Government without exacting or receiving any compensation for these ores, or without requiring a mine to buy or pay for the land. It has gone further, and recognized the possessory rights of these miners, as ascertained among themselves by rules which have become the laws of mining districts as regards mining claims; but in adding this it has not parted with title to the land, except in cases where the land has been sold in accordance with the provisions of this law on that subject. If the tax of the State of Nevada is, in point of fact, levied on this property right of the United States, we are bound by our previous decisions and by sound principles to hold that it is void. If, on the other hand, it is levied upon the property of the miner, and may be collected without affecting or embarrassing the title of the United States to property which belongs to that Government, then there is no ground for interference with the process of the State in its collection. A few extracts from the statutes of Nevada showing the nature and character of the property on which the contested tax is imposed, and the manner of its enforcement and collection, will enable us to decide whether it belongs to one or the other of these classes. We copy here important sections of the Act of February 28th, 1871, imposing this tax. After quoting so much of the law as is necessary to its proper construction, we find that under it, where ore is detached from its bed it becomes personal property, free from any lien of the Government and subject to taxation. It does not seem to us that there can be any reasonable ground for asserting that the United States has any interest in the tax or in the sale of property for said tax. It is, however, urged with more show of reason that section six, which makes this tax a lien on the mines or mining claims from which ores or minerals bearing gold or silver are extracted for reduction, is an interference with the right of the property of the Government. An examination of the language we have quoted will show that it was carefully prepared to avoid this objection, and we think it does. The use of the words "mines or mining claims" is evidently intended to distinguish between cases in which the miner is the owner of the soil, and therefore has a perfect title to the mine, and those in which the miner does not have title to the soil, but works the mine under what is well known in mining districts, and what is, as we have said, recognized by an Act of Congress, as mining claims. In this first case the statutes make a lien on the mine, because the title to the mine is in the person who owns it, and should pay tax. In the other tax is a lien only on the claim of the mine; that is,

## On His Possessory Right

To explore and work the mine under the existing laws and regulations on the subject. In the former case, of course, the United States has no interest to be protected, and the State is at liberty to declare and enforce such lien for her taxes. In the latter case, such rights as the mining laws allow and as Congress concedes to develop and work the mines are properly in the miner. That it is so shown is clear by the conduct of mining corporations in whose interest this suit is brought, which, for the purpose of evading this tax, permits its investment in this mine (said to be worth from \$50,000,000 to \$100,000,000) to rest on this claim, this mere possessory right, when it could, at a ridiculously small sum compared to the value of the mine, obtain the Government's title to the entire land, soil, mineral and all. These claims are subject to bargain and sale, and constitute very largely the wealth of the Pacific coast States. They are property in the fullest sense of the word, and their ownership, transfer and use are governed

by the well-defined basis of this law, and are recognized by the States and Federal Government. This claim may be sold, transferred, mortgaged or inherited without infringing the title of the United States. Why may it not also be subjected to a lien for taxes, and the claim, such as it is, recognized by the statute, be sold to enforce the lien? We see nothing in principle or in any interest which the United States has in the land to prevent it. We are of opinion that the decree of the Circuit Court dismissing the bill of the appellant on a demurrer was right, and it is therefore affirmed. Justice Field, being disqualified by reason of interest, took no part in the decision of this case. Justice Miller delivered the opinion.

## Another Dry Placer Machine.

A short time since we published a description of a machine for working dry placers, which was in operation in New Mexico. Considerable inquiry has been made concerning these machines, as there are plenty of places in this State, as well as in Western Nevada and Arizona, where ground not now available could be made to yield profitable returns, if the machine is all that is claimed for it. We notice that another machine of its kind has come to the front, which has been experimented with by Messrs. Duhem & Bennet, of Denver, Colorado, for some time.

A few weeks since they made their first public test, with results which, though not pecuniarily large, were satisfactory to the parties interested. The Denver Times describes the apparatus as follows:

"The machine, which is portable, being mounted on wheels, weighs about 4,000 pounds, exclusive of an eight-horse power engine and hoiler required to run it, is placed upon a mine in the South Park, about 10 miles east from Hamilton, and one mile south of Terray creek. This mine was chosen more as a test than for any hope of profit, it being an abandoned mine, and the gold being extremely fine. On this mine can be had nearly all kinds of dirt, from black bottom clay and mud to the ordinary gravel deposit, and, in fact, for a thorough and severe test no better spot could have been selected. Two experienced miners, working here with the sluice, cleaned up a little less than \$6, for their joint labor for six days. At the end of a six-day run, during which much non-pay dirt was put through (it being necessary to handle the latter in searching for this pay streak), the machine cleaned up \$99.94, as stamped by the Denver mint. And when it is taken into consideration that the 60 odd square feet of copper surface was new and rough, with a number of riveted seams, and that they were not cleaned with a view to taking all the gold, it will be evident that as much more was saved. The necessary expense of running is from \$10 to \$12 per day, and this will decrease as experience is gained; but taking the highest figure of expense, and leaving out of consideration the gold saved and absorbed (so to speak) by the 60 feet of surface, the mint assay shows a clear profit to the machine of \$25 for the first six days' run. Experienced mill men have estimated the gold saved and still on the plates at from \$75 to \$100, and it is fully believed that the next week's run will not fall short of \$300, which will leave a net profit of \$225 to the machine, and this on a mine where 50 cents per day to the man cannot be had with the sluice.

"During the six days all kinds of dirt were put through the machine—clay, fine sand and gravel; each in their turn was tried with the same results, save that the coarse material was handled a little more expeditiously. Heavy sods, six inches thick by 10 to 12 inches wide and two feet long, were dumped in and came out torn to shreds and perfectly washed of all dirt. Instead of 800 pans per hour, as claimed by the inventors, the capacity of the machine was found to be from 1,000 to 1,400 pans per hour, or 80 to 100 cubic yards per day of 10 hours, varying a little with the kind of dirt being dressed. During the trials the tailings were frequently tested by careful panning, both by interested parties and persons present as spectators. No gold was found at any time by any person in the tailings—the machine having taken up, so far as is known, every particle. The water required to run this machine may be drawn from a good well, and though a dump for tailings is always desirable, it is not essential in this machine. The inventors, in their circular of a year ago, disclaimed any hope of ever being able to compete with the sluice where water could be had, and this gold not too fine for sluicing, but this last trial develops the fact that their machine is in advance of the sluices in every respect, especially where the dirt has to be handled to get it into the sluices. Each machine gives employment to three or four men, and there is ample room in Colorado alone for several thousand of them, to say nothing of California, Arizona, New Mexico, etc. That they can be made to pay on very low-grade mines, is evident from the above figures. The fact that one party has contracted for 10 of these machines, another for 15, another for seven, while five more are bonded to still another party, and that each of these parties were personal witnesses of the test above described, speaks volumes for the machine. As soon as the contract can be let, these machines will be commenced. They will be slightly improved, and of a little greater capacity. We shall, from time to time, report on this new departure in placer mining."



### The Sierra Flume and Lumber Company.

This company was incorporated under the laws of the State of California, November 11th 1875. The object was to engage generally in the manufacture of the Sierra mountain timber into lumber, and also to manufacture the lumber into the various forms for which it is adapted. The operations of the company are of a magnitude scarcely to be imagined by those who have given the subject no attention, and the whole undertaking is so varied in its different departments as to form an interesting subject to the public.

The slopes of the Sierra Nevada are covered with immense forests of pine, spruce and fir timber, which until now has been scantily utilized, the lumber mills of the northern coast furnishing all that material used east of Sacramento. For nearly a hundred miles in length in the counties of Butte, Tehama, Plumas and Shasta, the Sierras are covered with a heavy growth of timber of the varieties mentioned, and the Sierra Flume and Lumber Company was organized to cut this timber, ship it to the mills and prepare it for market. The difficulties of carrying out the idea would not be apparent to those not familiar with the region mentioned, but they were such that it required a large expenditure of capital, such as a powerful company alone could afford to make, to carry out the plan in all its details.

The timber supply of the company lies along the west slope of the Sierra from Butte creek, in Butte county, to North Battle Creek in Shasta county, and also around Deer creek and Big Meadows, Plumas county, and the timber area is said to be ample for fifty years' operations. If the pine and fir of this region do not reach the majestic proportions of the *sequoia gigantea* found in Mariposa, Calaveras, Fresno and more southerly sections of the State, they attain an extraordinary size, and are perhaps more valuable as articles of commerce and for administering to the wants of man. Of this area of country, considerably more than one half is occupied with timber, which can be manufactured into merchantable lumber. The remainder consists of scrub timber and cord wood, and at intervals occur those valleys or basins of tillable land and meadows met with on the western slope of the Sierra.

The best timber is found at an altitude of from 3,500 to 6,000 feet, up to the snow line. Until a comparatively recent period nothing but the very fringe of this timber country was explored. No use was made of these magnificent forest trees which abounded in such quantities, except where they happened to be located near a mining camp. And then only such small portions were felled as were necessary for the purposes of mining work, or for fuel. This whole tract of country, with its wonderful sugar pine, yellow pine, spruce and fir was regarded as comparatively worthless. It is only recently that the light began to dawn upon our lumbermen, that California had within its own borders, lying neglected, a class of timber equal to any imported from the East for the manufacture of flooring, doors and window sashes. The well-known and useful redwood was supposed to comprise the valuable lumber resources of the State.

The sugar pine taking the place of Eastern white pine, and equal to it as finishing lumber, is used exclusively by the company for sash and doors and outside blinds. For all finishing lumber, and for all uses where a soft, while straight grain is required there is no wood grown on the coast to take its place. The heart is desirable for shingles, railroad ties, etc. It is largely used for box, trunk and other manufactured lumber. Heart sugar pine shingles are free from some of the objections of redwood shingles, and make an equally desirable roof.

The yellow pine takes the place of sugar pine for many purposes; it is a soft, white, even grain, but works a little harder and is a firmer wood than sugar pine, much of it resembling sugar pine so closely as to be scarcely distinguishable from it. For flooring, rustic, stepping, ceiling, wainscoting, pickets, etc., it is superior to any wood grown west of the mountains, and in appearance is all that could be desired; some of

it is as handsome as many of the ornamental woods. For building lumber, fencing, etc., is generally preferred to sugar pine; for all interior work for finishing purposes, such as windows and door frames, base boards, etc., no better lumber can be found. It is also largely used for box lumber. The heart makes good railroad ties.

The spruce, (sometimes called red fir), is a strong timber adapted for scantling, joists, timbers, and work requiring strength and durability; it stands exposed to the ground or weather. This wood is much the same and equal in all respects to Puget Sound lumber, making good railroad ties, foundation and bridge timbers, flooring and fencing. For heavy plank sidewalks, platforms, ship plank, car floors and frames, and similar work it is specially adapted. It makes good laths, that do not stain and is also very useful for shelving, being free from pitch or odor.

The fir, (sometimes called white fir), is useful for fencing, ceiling, wainscoting, scantling and makes excellent box lumber. It is free from odor and pitch. In color the wood is white and makes laths which do not stain.

The cedar is used chiefly for fence posts and is equally durable with redwood—it is in fact a variety of redwood.

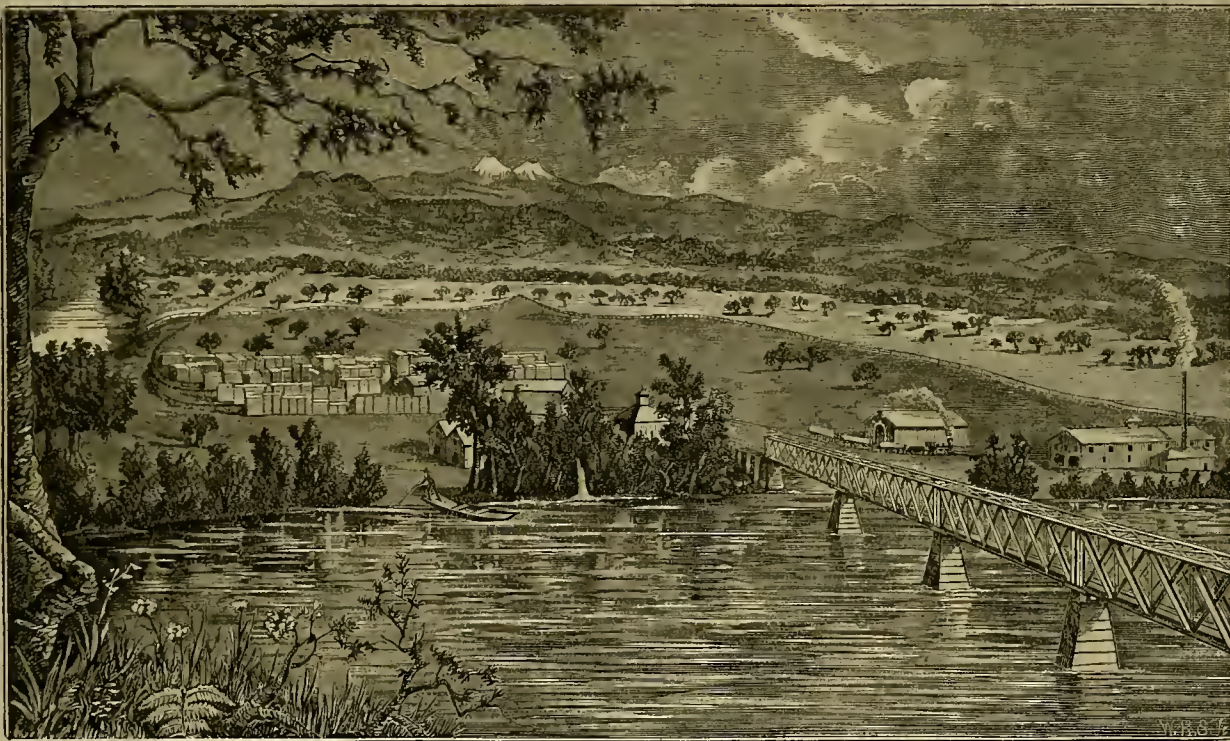
With large tracts of timber of these varieties, the next consideration of the company was the means of transportation. After the value of the wood was admitted, the freighting of the lumber from the mountains to the towns and cities would make it so costly as practically to exclude its general use. It was clear that no

the Red Bluff division. The Defiance, Enreka and Clipper mills send their lumber by branches into one main flume, which delivers the lumber at Red Bluff.

On the other ridge is the Chico flume, which carries the lumber for the Cascade, Arcade and Belmont mills. The Arado mill was burnt not long since, but has been rebuilt. The Champion and Last Chance mills float their lumber into Sesma.

The mills in the mountains and the yards in the Sacramento valley are connected by telegraph lines, and arrangements are complete for filling orders as quickly as if the mills and lumber were on the railroad. The telegraph system extends along the flumes, so that the section men can advise one another of any "jams" in the flume in case any occur.

The accompanying engraving which we have prepared shows the works of the company at Red Bluff, at the bend of the river and opposite the town. The bridge shown connects the works with the town. The flume coming down from the mountains branches off into several divisions in the yard, for convenience in separating the lumber and piling. The office of the company is seen among the trees by the river, and right in front of it is where the flume empties into the river. The storehouses, stables, etc., are also shown. The railroad tracks wind about in the yard and run across the bridge, connecting with the Oregon division of the Pacific railroad. The flume is seen winding down from the mountains in the distance. This is one of the principal termini of the company. On the right is shown the large sash and door



YARD AND WORKS OF THE SIERRA FLUME AND LUMBER COMPANY, AT RED BLUFF.

logging camps could be run at a profit where roads had to be constructed and kept in order in almost inaccessible regions, and the lumber hauled forty or fifty miles to a market. The V flume then came into requisition. These flumes are built V shaped, and are intended to float the lumber, etc., down from the forests to the yards. The engineering obstacles alone were difficult to overcome, being somewhat different from railroad engineering. In a V flume the grade must be continuously downward—as, of course, the water will not run up hill—although the grade varies along the line. In some places immense trestles are made to carry the flume, which makes the undertaking expensive. This class of flume costs from \$1,500 to \$2,500 per mile, but answers the purpose admirably.

In addition to the flumes necessary to carry out the operations, saw mills had to be built, railroad tracks laid at the yard, telegraph lines constructed, and all the necessary details carried out for transacting the business of the company. The result has been the successful organization of a company second only in magnitude in the State to the Central Pacific Railroad Company. Not only does this bring into full development the timber resources of the State, but the public are insured a constant supply of sugar and yellow pine at rates much below those which have hitherto prevailed. The consumers of sugar pine have heretofore paid very high prices, so that comparatively few could afford to use it.

The company is now operating over 150 miles of V flume for lumber transportation: one flume on Chico creek terminating at the town of Chico; one on Antelope creek terminating at Sesma; and one on the waters of Battle creek, terminating at Red Bluff. On these flumes there are ten saw mills in operation with an estimated capacity of between 300,000 and 400,000 feet daily. The Moscow mill is one of the largest, and is at the head of

factory, and the fully equipped planing mill. The company have also a planing mill at Sesma, and a large sash and door factory at Chico, with a capacity of 200 doors, 100 windows and 50 blinds daily; also a large planing mill for the manufacture of flooring, rustic, ceiling, shingles, laths, pickets, moldings brackets, etc. It is the purpose of the company to manufacture and keep on hand an ample supply of seasoned lumber, and to reach the consumer through dealers, and manage its business as manufacturers merely. A full stock of all kinds and dimensions of lumber is kept, so that an order for all parts of a house may be filled at any time. The facilities for rapid shipment from the mountains and by rail offer unusual opportunities to the trade for supplying demands, without carrying large stocks of lumber in yards.

As will be seen by what we have said, this lumber enterprise was inaugurated at large cost, in the belief that the supply of the Sierras could be brought into market at prices to compete with the most favorable terms of other manufacturers. The company pay out about \$450,000 per annum, and are continually increasing their facilities. They employ over 500 men, 500 head of work cattle, 100 horses and mules, 37 logging trucks, 24 wagons, and cut 30,000,000 feet of lumber in 1876. This year they will cut over 50,000,000 feet. We have by no means given a detailed account of the company's operations, and shall take occasion to recur to the subject again.

THE HEALTH OF FARMERS' WIVES will be discussed by Dr. Dio Lewis, by invitation of Temescal Grange, in Armory hall, Oakland, at 7:30 o'clock, Saturday evening, Sept. 22d. The lecture is free, and all are invited.

THE City of Peking carried back to China, this week, 640 Chinamen.

### A Pocket Laboratory for Prospectors.

Mr. J. S. Phillips, mining engineer and assayer, of 504 Washington street, has shown us a very portable arrangement of useful tools, which he has appropriately named the "Pocket Laboratory." It is a marvel of completeness, being not only the most compact but best arranged cabinet for blow-pipe analysis and assaying we have seen. It is equally adapted for safe conveyance and accuracy. For prospecting purposes the arrangement devised by Mr. Phillips is admirable.

The case is made of lacquered or bronzed brass, and is six inches long by three inches wide, and one inch and three-eighths thick when closed, so that it is easily placed in the pocket. On placing the hinge of the box down and towards you, after opening two strips of brass that serve the double purpose of securing the cover and for filtering and test tubing beyond the end, the cover may be opened out as a table in front, whilst the two feet are swiveled out behind from the bottom of the box for an opposite adjustable collateral support. The following tools will now be exposed: a blow-pipe, a pair of pliers and forceps, platinum wire and handle, two test tubes (open and close), a small magnetized steel bar, spatula and charcoal borer, a camel-hair brush, test papers for alkalies and acids, a small glass funnel and two dozen filters. After these and three large flux boxes (containing litharge, test lead and bone ash) have been removed, a five-inch nickel beam

will appear, with pendulous needle pointer, knife-edged gudgeon and suspenders, the whole being supported upon a pendulum cradle and lowered, in a long internal guide, by a very convenient external screw.

The beam and pans now being placed in working position, and the various tools at hand, six small flux boxes are found, placed in a horizontal row, and firmly attached to the back of the case, containing carbonate of soda, borax, microcosmic salt, dry nitrate of cobalt, nitrate of potash and boric acid, which are also necessary in qualitative blow-pipe analysis and assay of minerals; and in lifting a hinged cover, in a chamber-leathered box, secured to the bottom of the case, are seen two "ton weights" (the one for furnace and the other for blow-pipe assays), and a full set of decimal Troy

weights, from ten grains to the one-hundredth of a grain, and a thread rider to be used on the beam, which is graduated to weigh to the ten-thousandths of one grain. The beam being very light and carefully balanced will weigh very minute quantities, and may be used for all kinds of assaying. We omitted to mention that the little box also contains a blow-pipe of peculiar construction, which may be closed up like a telescope for compact transportation. The price of the "Pocket Laboratory" is \$50.

Mr. Phillips appears to take great interest in prospectors and their works of exploration and mining, as in addition to this he is the inventor of the "Wee Pet" assaying machine, which packs, with all tools and fluxes, into a five and a half inch box. We are told that it will assay silver to within five per cent., and its cost, with tools, fluxes and instructions, is \$100.

"The Tester" is another of Mr. Phillips' contrivances, which is still more portable and cheaper, costing \$40, but is not so accurate, as it may be ten per cent. in error. It is a modification of the above, being more simply arranged, and its samples and buttons are measured for direct value.

To those having either of these machines, Mr. Phillips now supplies the necessary composition supports, cupels, fluxes, etc., for working about 50 assays, singly arranged in one convenient traveling cabinet, for \$20.

The "Vest Pocket Blow-pipe" is still another very convenient little instrument, with several important peculiarities, from his design, and which he supplies separately from the "Pocket Laboratory." It is just three inches long, when placed in its most compact form, and may be fitted for work in a few seconds. Price, \$3.

Mr. Phillips is the author of the "Explorers', Miners' and Metallurgists' Companion," a practical work of 672 pages, the largest and most comprehensive work on mining subjects.



### The Gravel Channels of Iowa Hill.

A correspondent of the Dutch Flat *Forum* gives the following:

Having returned home from an extended examination of all claims lying within a radius of 20 miles from the business center of Iowa Hill, I shall now continue the series of letters, without interruption, until I tell you all I have seen and all I have learned during my late trip.

I spoke in my last letter of operations going on during the summer in our immediate vicinity, supposing at the time I had mentioned all. I find, however, by further inquiry, I omitted one claim that ought not to have been omitted. Some years ago, in the first times, when gold lay scattered around everywhere, rich diggings existed at King's Hill, Elizabethtown, some two miles south of our mining center. Rich deposits were found in different places at the base of the hill, but giving out in every direction, the place has since been comparatively deserted. This summer a company, composed of some of our best men, has been formed, called

#### The Erin-Go-Bragh,

For the purpose of tunneling the main bill, to find, if possible, the original source of the early deposits. They are already in 540 feet, and intend going on, regardless of expense, until satisfied one way or the other. This company deserves great credit, and, as they are working with courage and determination, we all sincerely hope fortune will finally reward their efforts, for success at this point will add greatly to our local wealth and reputation.

We must now turn our heads northeast, some 12 miles from town, to a strip of country called the Hogshack, stretching from the old Fork's house to the Secret House hotel, and thence to Tadpole station, the present headquarters of the Iowa Hill canal company, making altogether about 23 miles from town, but still within the radius of our business center. To examine this singular strip of country, and the works commenced upon it this summer, formed the principal object of my late trip; for it promises, beyond all doubt, in a short time to become the most prominent mining feature of Placer county, if not of the entire State. From the points mentioned, beginning at the Fork's house and ending at Tadpole, 11 miles, the whole belt is one immense, unbroken gravel deposit, marked and conspicuous in its course, and evidently the old channel of the American river, now flowing along its base some thousands of feet below. The surface indications are most favorable, quartz and small black iron stones predominating. Of late years, at different times, the range has been regarded with a covetous eye, and locations made, especially while cutting the Iowa Hill canal, which traverses the entire length. These demonstrations ended where they began, and beyond locations being made, nothing was afterwards done, if we except the laudable exertions of Mr. Rennyson, of the Secret house, to get some responsible parties to take hold in earnest. Finally, a gentleman from Oroville, whose name escapes me for the moment, was brought in to see the "promised land," and, being an intelligent man, as well as an experienced miner in search of territory, his practical eye took in the chance at once, and he thereon located the Oroville. From this time, I believe, dates the speedy occupation of the whole 11 miles by companies of men from San Francisco, Georgetown, Placerville, Auburn and Colfax, capable and determined. I am told, of pushing their respective tunnels to a final issue.

The different claims on the Hogshack, as they stand in rotation, are the Colfax, San Francisco, Mao, Georgetown, Bath, McMuggins, Auburn, Riverside and Cove, requiring generally some 400 or 500 feet of tunnel to tap the channel. Of these, seven are at work, some of them day and night, and making good progress. The Bath, when in 20 feet, struck water, and their present tunnel being too high, will eventually be used for ventilation. The San Francisco, with McCarty as foreman, has sunk shafts; one, 30 feet deep, developed handsome looking gravel, with large boulders and quartz rock, but at that depth water drove them out. Their tunnel is now in over 50 feet, and the whole length is estimated at 250 or 300 feet at the outside. The largest and most central claim is the Mao, with 4,800 feet frontage, being a consolidation of four claims, the Mao, Georgetown, Cherokee and Oroville. To this claim and the San Francisco we may look for the first developments. The Mao people first ran an open cut by washing, and, when in some 30 or 40 feet, opened about three inches of gravel below the cement, which gave a decidedly good prospect. They then commenced their tunnel, considering 250 feet would strike the channel thoroughly. They had run about 40 feet at the time of my visit. As I have already said, all these claims, from one end to the other, are commanded by the Iowa Hill canal, so that if any hereafter should prove good for piping, they will have the first and best show for water.

Such is the new and extensive territory in progress of development at present. Whether any company will get through this season, I do not know. In one respect I think they have all made a mistake. Taking it for granted that any one tunnel will prospect the whole 11 miles, which is really the case, I think it a pity all the companies did not unite on either of the central claims, the Mao or San Francisco, and run the tunnel through at once. Contracts have been

taken at \$4 a foot. To concentrate on one tunnel would be far the quickest way of making a development and also the cheapest in the end to each individual concerned. However, that cannot well be done now, and so we must wait results as they come.

A few words, by the way, about this channel before I close. As I have already said, it is well defined and prominently marked throughout its course. It is quite plain where it crosses the Tadpole station into the Hogshack, thence west to Indian springs, and thence to the south of the Fork's house. Here it suggests a new idea. Is not the Hidden Treasure claim, at Sunny South, which has lately become justly celebrated for its richness, the outlet of this great ancient river bed, and not, as hitherto supposed, the outlet of the old Damascus channel? For my part, I am strongly impressed with this idea; and the more I travel over the ground from point to point, in search of connecting links, the stronger the idea becomes. Nor does the idea, taken in its fullest sense, tend to lessen the importance of the Hidden Treasure or the Damascus claim as developed facts. On the contrary, suppose this to be the main channel of the Hidden Treasure, intersected by, but not a continuation of, the Damascus channel, then the confluence of the two will naturally be the richest point on their line of territory, and so, in fact, both claims gain in importance to the last foot of ground they respectively own. But taking the initiatory, from facts as they present themselves to-day, suppose, I say, the Damascus channel has no connection with the Sunny South, still no harm is done to either; yet the suggestion accepted as it is made, in good faith, opens another large territory nearer home, to the prospector for examination, and one, perhaps, that will repay the labor. Let me ask whether this idea is not strengthened by the late failure in the Centennial shaft? Would they not have a better chance for success had they gone higher up? However this may be, I am thoroughly satisfied, from late examinations, that we must accept a thorough "change of base" before any material success attends prospecting in any branch of the Shirt-tail territory, and that the man who first disposes himself of our preconceived ideas of the Damascus channel going to Sunny South, will be the most likely man to win.

### Working Flue Dust.

The Lemmon mill has been shut down since Tuesday last, in order to make some necessary alterations and changes in the machinery. In all new enterprises much is learned in the practical workings, and suggestions as to improvements are gathered by experience. Messrs. Clark & Wallace have had many obstacles to contend with in their endeavors to profitably work the waste that pours out of the furnaces, and have very nearly achieved a success. Starting in with an old-fashioned mill, and one that was hardly calculated for the peculiar work necessary for the roasting and amalgamation of the fine particles that had escaped from the smelting furnaces, they found that a complete overhauling and readjustment of the roaster, pans, concentrators, etc., was the first step toward the successful prosecution of the work. They were still further retarded by the rust that had accumulated on the iron work, and the decay of the wooden portion of the mill, a consequence of a long period of disuse, some five years having elapsed since the mill was in operation. The dust has been hauled to the rear of the works, screened, and passed through the roaster, and from thence taken to the pans, concentrators and agitators for amalgamation. The chief trouble heretofore has been experienced in the concentrators. The dust, during its exposure, has become mixed with a large quantity of small pebbles that have been sluiced in during the washing out of the fume arrester, and blown in from the neighboring hillside. These passed through the roaster and pans without trouble, but, on reaching the concentrators, settled to the bottom and formed a hard layer. The quicksilver, sinking into this bottom, remained sluggish and failed to come in contact with the precious particles, thus interfering with the amalgamating process. If an added motion were given sufficient to keep the pebbles suspended, the result was that the quicksilver failed to gather and was drawn off at the discharge holes. Another obstacle to successful amalgamation lies in the fact that the gold and silver escaping from the flue has become oxidized, by contact with the fumes in the furnace, and in consequence the coating prevents the quicksilver from taking hold of the precious metals. The proprietors propose to overcome both of these difficulties by grinding the dust to an impalpable powder. The dust will be screened, passed through the roasting furnace, and then spread out on the floor to cool. At this point they have put in a couple of burr stones, and it will be crushed and ground between these before going into the pans. This will do away entirely with the nuisance of the pebbles and foreign matter, and the process of grinding will present new polished surfaces, not oxidized, and thus the silver and precious metals will amalgamate readily. Mr. Clark is very sanguine that the improvement will overcome all difficulties and make the enterprise a perfect success. We heartily hope that he has struck the right method, as everybody in the district is interested in the economical extraction of the gold and silver from an article that, up to the present time, has been considered as waste. —*Eureka Sentinel.*

### Fire Proof Construction.

Wm. T. Coleman & Co. make an exhibit in the machinery department of materials for fire-proof construction of buildings, which is of interest to the general public as well as to engineers and builders. Hoyt's patent iron lath and furring is now in use in many of the most important buildings in the country, and is well worth close examination. The lath embraces the maximum of stiffness, minimum of metal, and maximum of clinch for plaster or mortar of any lath made. It can be used: 1st, in connection with the patent arches, making both floor and ceiling; 2d, under arches of any kind to make flat ceilings; 3d, for grounds of every description of cornice work or moldings in plaster; 4th, for partition or iron studding, making a tight stiff fire-proof partition; 5th, for partitions using wood studs, so that when the floors are fire-proof so little wood is used there is no danger of fire; 6th, for ceiling under wood joists, etc. The lath is made of light sheet iron made in a peculiar manner so as to answer its purpose admirably.

The patent combination floor and ceiling, which consists of the corrugated arch and lath in connection, is fire-proof, strong, light and economical. The patent corrugated iron arched ceiling for making fire-proof floors is a very important improvement, and is now in extended use. A familiar example in this city is the ceiling in the Safe Deposit building. The weight of a corrugated iron arched ceiling is less than one-tenth the weight of a brick arch, so that less beams are required, cost of construction is lessened, and the relief of weight on the wall is great. In strength it is superior to that of a brick arch of the same span, as has been proved by severe tests. The arch being in one piece does not give any from the force of a blow as brick does. This method of making fire-proof floors has stood the test of all the large fires in this country. In cells for jails these arched plates are particularly adapted, giving more room in the cell and aiding to make a stronger prison.

The fire-proof shutters which are manufactured by the owners of these patents have stood many fires. Over seven thousand pairs were put up in Boston after the fire. The frame is made of one continuous piece of channel bar, and is then filled with three thicknesses of iron in shape of what is known as "leveled corrugation." The two outer plates are put into the frame with the corrugations perpendicular. The inner plate has the corrugations horizontal, or at right angles with the others, which gives immense stiffness to the shutter. The hinges are bolted through the channel bar frame, and the whole finished by a striking plate. The shutter has two air chambers, and it is claimed will not warp in the greatest heat.

Wm. T. Coleman & Co. are also agents for Hoyt's patent fire proof roof. A first-class roof of this construction is made as follows: the ceiling of the rooms is of plaster upon the patent lath; upon the upper side of the rafters is a solid covering of corrugated iron, fine corrugations, with the corrugations horizontal. This makes the roof exceedingly stiff, acting the same as matched planking. The iron is covered with an adhesive non-conducting compound, and in this are embedded the slate, which are also bolted through the whole with Swedish bolts. The result then is, working from the rooms below: plaster, iron lath, air chamber, corrugated iron, non-conductor and slate. The rooms under the roof are fully as comfortable as any in the building, being cool in summer and warm in winter.

Different styles of fire-proof roof are made for piers, railroad depots, factories, etc. In church roofs by means of the iron lath in connection with the construction, any affect designed by the architect can be produced.

The arched ceiling floor with iron lath are shown in the pavilion entirely and partly completed so that visitors can see the method of application of the plaster, etc. Wm. T. Coleman & Co. are agents for all these improved fire-proof construction materials.

MINERAL HILL.—Mining matters are very quiet at the hill. The English company have as yet made no move toward working or developing their property. Capt. Plummer, the Superintendent of the company's affairs, has given the property a thorough examination, and sent an elaborate report to London in reference to the mine. We understand he has a very favorable opinion of the ground, and has recommended that explorations be carried on with a view of determining its value. Capt. Plummer is a talented miner, of large experience, and his opinion will carry great weight with the company. The recent shipment of ore from the hill to the Lemmon mill was made by the choloriders, and is the product of their summer's work. After its reduction, and on receipt of returns, the burg will, for a short time, roll on the top wave of financial prosperity. —*Eureka Sentinel.*

A SWEET REMEDY.—H. F. Andrews, M. D., of Washington, Ga., says that cologne water is an efficacious remedy for poisoning by poison ivy. A good article of cologne must be used, and frequently applied. The vesicles should be broken when the remedy is applied.

### Our Paper Mills.

Near our stand in the pavilion is a small but elegant exhibit of the productions of our paper mills, which industry is fast assuming a position of importance among our manufactures. We believe there are five mills engaged in the manufacture of this article in this State, whose capacity and location are as follows: Eagle Mill, Point Arena, straw paper, 25,000 reams per month; Pioneer Mills, Marin county, printing and Manila paper, 65,000 pounds; Stockton Mill, printing, 90,000 pounds; Saratoga Mill, straw, 5,000 reams; Lick Mill, Alviso, straw and Manila, 5,000 reams. A large new brick mill is now being erected at Stockton for the manufacture of news paper, that is to have a capacity equal to all the foregoing mills combined, and is expected to be in running order about February next. It is to run on tule as a material.

Straw paper wholesales at about 85 cents per ream, and retails at \$1, though heavier paper rates at 15 cents more per ream. This manufacture utilizes a large amount of oat straw in Marin and Mendocino counties, where the most of this brand here used is made, which would otherwise be left on the ground to rot or be burned.

The process of making paper is quite interesting when seen for the first time. In brief, the materials are ground to a pulp, and then strained and what is retained on the strainer is the paper. That is the way it appears to a novice, and yet this simple operation requires a great deal of complicated machinery, that we have not space to explain here. Paper or papyrus has been known to writers for ages and ages, as even the ancient Egyptians made a fair article from the "tule" of the Nile. Our ancestors used mostly parchments made of sheepskins. In the early days of paper proper, only the best of material was used to manufacture it of; first linen, then cotton; now almost anything will do, as we use straw, wood, tule cactus, many kinds of weeds, and almost any light-colored substance that can be pulped.

In the paper business of this city, Messrs. S. P. Taylor & Co., take the lead in handling the home produced article, and are agents for the most of our mills. With so much competition in this business the profit of the smaller mills have been very light to manufacturers, and some of the these mills have repeatedly changed owners on account of exhausted bank accounts. Now the price is very low, but the falling prices of labor, is assisting the proprietors of the mills, so that they are still enabled to run. Messrs. S. P. Taylor & Co. have a large establishment at No. 416 Clay street, well stocked with all grades and varieties of printing, straw, manila, and wrapping papers, as also blank hanging paper, paper bags, etc., and supply any order at short notice. Controlling as they do the product of several large mills, they can fill the largest orders at a comparatively short notice, even if they have not in stock a shipment of it. Prompt attention to business, fair dealing, and moderate demands for profit, have made them popular with producer and consumer.

They make a small but elegant display of blank hanging papers in rolls, printing paper, straw, manila, and colored wrapping papers, near our stand in the pavilion, and might fill all the space that could possibly be accorded them with specimens of different kinds, but it was considered needless.

### The Ridge.

The San Juan Ridge from French Corral to Eureka is without doubt the richest and most extensive mining section in the State. All the mines in that belt yield large returns for labor expended. The claims owned by the Milton company have sent out bullion this year enough to satisfy the greediest stockholders. The North Bloomfield has had some very large returns at each clean-up, and we learn promises better at the coming one than ever before. The claims at Moor's Flat are also all doing well. But the new developments going on up there are what is attracting more attention than the returns from developed mines. The Hunt claim east of Moore's Flat, the Watt Blue Gravel between Moore's and North Bloomfield, and the Derbeck claim at Bloomfield are getting well under headway, and before many months will begin to commence taking out gravel. They will be worked by drift mining, and will, it is expected, pay better than if worked by hydraulic process. Their success will start up dozens of other claims on the same channel, and will make that section the liveliest and most prosperous on the coast. We learn that the Watt company have got their shaft down 160 feet and are going through pipe clay—a substance always found above gravel deposits on that channel. It is expected they will have to sink between 300 and 400 feet to strike bed-rock. But the balance of the sinking will necessarily be through softer ground, and more rapid progress will be made. It is safe to assert that drifting will be going on before snow flies in that section. A party of gentlemen from this city were up there this week. They report the prospects of that section as very flattering. Capital is bound to seek the miles of undeveloped ground there for investment at no distant period. There is no better or safer place to mine. There is no more extensive field. So long as such territory remains unworked there is no use of seeking distant places in which to prosecute mining. —*Nevada Gazette.*



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METALS.	
WHOLESALE.	
THURSDAY, M., September 13, 1877.	
IRON.—	
American Pig, ton.	23 00 @ 32 00
Booth Pig, ton.	23 00 @ 32 00
White Pig, ton.	23 00 @ 32 00
Oregon Pig, ton.	23 00 @ 32 00
Reddish Bar.	3 1/2 @ 6 1/2
Horse shoes, keg.	5 00 @ 6 00
Nail Rod.	— @ 7 1/2
Straight, Oval.	— @ 7 1/2
Roller.	— @ 7 1/2
COPPER.—	
Copper Tinned.	37 00 @ 40 00
Sheathing, B.	37 00 @ 40 00
Sheathing, Yellow.	21 00 @ 22 1/2
Sheathing, Old Yellow.	19 00 @ 11 00
Composition Nails.	21 00 @ 22 1/2
Composition Bolts.	24 00 @ 25 00
STEEL.—	
English Cast, B.	14 00 @ 25 00
Anderson & Woods, ordinary sizes.	16 00 @ 18 00
Drill.	16 00 @ 18 00
Flat Bar.	15 00 @ 18 00
Flow Steel.	8 1/2 @ 12 1/2
TIN PLATE.—	
10x11 C Charcoal.	8 50 @ 9 00
Bacon Tin.	19 00 @ 20 00
Australian.	19 00 @ 20 00
ZINC.—	
By the Cast.	11 00 @ 12 00
Zinc Sheet 7x14, 7 to 10, B.	11 00 @ 12 00
7x14, 11 to 14.	11 00 @ 12 00
7x14, 15 to 18.	12 00 @ 13 00
8x14, 11 to 10.	12 00 @ 13 00
NAIL.—	
Assorted sizes.	300 @ 325
By the lb.	47 1/2 @ 50

# GENERAL MERCHANDISE.

[WHOLESALE.]

WEDNESDAY M., September 12, 1877.

## RICE.—

King Standard Wheat, 11 1/2.	3 00 @ 3 25
Neville & Co's.	3 00 @ 3 25
Hand Sowed, 22x36, 11 1/2.	3 00 @ 3 25
21x36.	3 00 @ 3 25
Machine Sowed, 22x36, 10 1/2.	3 00 @ 3 25
Flour Sacks, halves.	5 00 @ 5 10
Quarters.	5 00 @ 5 10
Eighties, 60 inch.	14 00 @ 15 00
Human, 60 inch.	14 00 @ 15 00
40 inch.	8 1/2 @ 9 00
Wool Sacks.	— @ —
Hand Sowed, 3 1/2, 4 1/2.	— @ —
Machine Sowed.	— @ —
4 R.	47 1/2 @ 50
Standard Gunnies.	15 16 @ 16
Bean Bags.	6 1/2 @ 8

## CANDLES.

Crystal Wax.	17 @ 17 1/2
Eagle.	17 @ 17 1/2
Patent Sperm.	25 @ 30

## ASSORTED FRUITS.

2 lb. doz.	3 75 @ 6 00
Table do.	3 75 @ 6 25
Jams and Jellies.	4 25 @ 6
Pickles, 1st gal.	3 50 @ 4
Sardines, q. box.	1 65 @ 1 90
Hf Boxes.	3 00 @ 3 25
Preserved Beef.	— @ —
2 lb. doz.	4 00 @ 4 25
do Beef, 4 lb. doz.	6 50 @ 7 00
Free Range Mutton.	— @ —
2 lb. doz.	4 00 @ 4 25
Beef Tongue.	6 50 @ 7 00
Preserved Ham.	— @ —
2 lb. doz.	6 50 @ 7 00
Deviled Ham, 1 lb.	— @ —
do.	3 50 @ 4 00
do Ham, 4 lb. doz.	3 00 @ 3 25

## COAL.—

Australian, ton.	9 00 @ 9 50
Coos Bay, 7 00 @ 7 50	
Bellingham Bay, 7 00 @ 7 50	
Seattle, 7 00 @ 7 50	
Cumberland, 14 00 @ 15 00	
Mt Diablo, 4 75 @ 5 75	
Lehigh, 22 00 @ 25 00	
2 lb. doz.	2 00 @ 2 25
West Hartley, 9 00 @ 9 50	
Scott, 8 25 @ 9 00	
Seranton, 13 00 @ 15 00	
Wauveau Id., 9 00 @ 9 50	

## CHARCOAL.

Charcoal, sack.	75 @ 80
Coke, bbl.	60 @ 65

## COFFEE.

Sandwich Id, lb.	21 00 @ 22 00
Costa Rica.	18 00 @ 20 00
Guatemala.	18 00 @ 20 00
Java.	25 00 @ 26 00
Manilla.	19 00 @ 19 1/2
Ground, in cs.	25 @ 26

## FISH.

Sack to Dry Cod.	5 @ 6
do in cases.	6 1/2 @ 7
Eastern Cod.	7 1/2 @ 8
Salmon, bbls.	9 00 @ 10 00
Hf bbls.	4 75 @ 5 25
Guinea, 2 lb. doz.	3 10 @ 3 20
Pick Cod, bbls.	22 00 @ 24 00
Hf bbls.	11 00 @ 12 00
Mackerel, No. 1.	14 00 @ 15 00
Hf bbls.	3 00 @ 3 25
In Kits.	3 00 @ 3 25
Ex Mess.	3 50 @ 4 00

## PICKLED.

Pick Herring, bx 3 00 @ 3 50	
Boston Smoked.	40 @ 60

## PLASTER.

Gold Mill.	3 00 @ 3 25
Lauf Plaster, in 100	@ 12 50

## NAILS.

Assorted sizes, keg 3 25 @ 4 00	
---------------------------------	--

## PAINTS.

Pacific Glue Co's.	— @ —
Neatfoot, No. 1.	10 @ 90
Castor, No. 1.	10 @ 90
do, No. 2.	10 @ 90
Boyal A. A.	25 @ 1 30
Olive, Plagnol.	5 25 @ 5 75
Possel.	4 75 @ 5 25
Palm, Id.	9 @ 90
Linsed, Id.	75 @ 80
Boiled.	80 @ 85
Cocoonat.	65 @ 68
China nut, cs.	68 @ 70
Sperm.	60 @ 65
do Whales.	60 @ 65
Polar, refined.	60 @ 65
Lard.	10 @ 12 15
Oleophine.	27 @ 28
Hyacinth Red.	75 @ 80
Photolie.	29 @ 30
Nonparel.	60 @ 65
Eureka.	25 @ 28
Downer Ker.	45 @ 50
Elaine.	45 @ 50

## PAINTS.

Pure White Lead.	9 1/2 @ 10 1/2
Whiting.	11 @ 12
Party Blue.	2 1/2 @ 3
Chalk.	14 @ 15
Paris White.	2 1/2 @ 3
Chhre.	3 1/2 @ 4
Avril.	3 1/2 @ 4
Avril Mixed.	3 1/2 @ 4
Paint, gal.	— @ —
White & tints.	2 00 @ 2 40
Green, Blue & Yellow.	3 00 @ 3 50
Light Red.	3 00 @ 3 50
Metallic Roof.	30 @ 60

## RICE.

China No. 1, lb.	6 @ 6 1/2
Hawalan.	5 @ 5 1/2

## SALT.

Cal. Bay, ton.	15 00 @ 25 00
Common.	10 @ 12 00
Carmen Id.	15 00 @ 25 00
Liverpool.	50 @ 60

## SOAP.

Castle, lb.	10 @ 10 1/2
Common brands.	4 @ 6

LUMBER.	
WEDNESDAY, M., September 12, 1877.	
CARGO PRICES OF PUGET SOUND PINE.	
REDWOOD.	
Rough, M.	14 00 @ 15 00
Refuse.	10 00 @ 11 00
Clear.	24 00 @ 25 00
Clear Refuse.	14 00 @ 15 00
Rustic.	27 00 @ 28 00
Superior.	20 00 @ 21 00
Refuse.	14 00 @ 15 00
Flooring.	26 00 @ 27 00
Refuse.	14 00 @ 15 00
Beard's Flooring.	18 00 @ 19 00
Refuse.	14 00 @ 15 00
Half-inch Siding.	20 00 @ 21 00
Refuse.	16 00 @ 17 00
Half-inch Surfaced.	20 00 @ 21 00
Refuse.	16 00 @ 17 00
Half-inch Battens.	18 00 @ 19 00
Pickets, Rough.	12 00 @ 13 00
Rough, Pointed.	14 00 @ 15 00
Fancy, Pointed.	18 00 @ 19 00
Shingles.	2 00 @ 2 25

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LEATHER.	
[WHOLESALE.]	
WEDNESDAY M., September 12, 1877.	
Soft Leather, heavy, lb.	26 00 @ 27 00
Light.	22 00 @ 24 00
Jodot, 9 Kil, doz.	48 00 @ 50 00
11 to 13 Kil.	53 00 @ 57 00
14 to 16 Kil.	57 00 @ 62 00
Second Choice, 11 to 13 Kil.	57 00 @ 62 00
Cornellia, 12 to 13 Kil.	57 00 @ 62 00
Femalia, 12 to 13 Kil.	57 00 @ 62 00
14 to 16 Kil.	57 00 @ 62 00
Simon, 18 Kil.	57 00 @ 62 00
Simon, 18 Kil.	57 00 @ 62 00
24 Kil.	57 00 @ 62 00
Robert, 7 and 9 Kil.	35 00 @ 40 00
Kips, French, lb.	1 00 @ 1 35
Cal. doz.	40 00 @ 45 00
French Sheep, all colors.	8 00 @ 10 00
Eastern Calf for Backs, lb.	1 00 @ 1 25
Sheep Roams for Toppling, all colors, doz.	9 00 @ 10 00
For Linings.	5 50 @ 6 00
24 Kil.	57 00 @ 62 00
Boot Legs, French Calf, pair.	1 00 @ 1 00
Good French Calf.	4 00 @ 4 75
Best Jodot Calf.	5 00 @ 5 25
Leather, Harrow, B.	48 00 @ 50 00
Pair Bridle, doz.	48 00 @ 50 00
Skinning, lb.	33 00 @ 37 00
Wet, doz.	30 00 @ 35 00
Buff, lb.	18 00 @ 20 00
Wax Side.	17 00 @ 18 00

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VIRGINIA CITY, August 25th, 1877.

Messrs. DEWEY & Co., Patent Agents, S. F.—Dear Sirs:—I take this opportunity to express my entire satisfaction with the business like manner in which you secured my patent for Clack Valve, No. 103,685. At any time should I meet with a friend, or any one who needs help in the patent business, I will direct them to you. Knowing you have the advantage over some of the patent agencies in the East, I would advise any and every one on this coast who want to get a patent to employ you. Yours truly, WM. C. D. BODY, 203 South B Street, Virginia City, Nevada.

P. S.—Sent a model back East about three years since and money to one agent, praying for patent on my improvement in Spike Drawer. I sent \$40 with model, the answer came back stating they had received the money and model, but they needed \$70 more before they would go on with my application. I thought it a fizzle, so I dropped it. W. C. D. B.

**EMILE BOESCH,**  
(Patentee and Manufacturer)  
569, MISSION STREET, below Second, S. F.



Hall and Show Window Reflectors of Corrugated Tin and Silver Corrugated Glass. Sectional Globes and Style of Ornamental Lamps for Hotels, Private Residences, Churches, Etc. Ship, Railroad, Street, Car, Coach, Mill and Mining Lampe and Reflectors

Of various patterns and sizes.

SPINNING OF SHEET METAL TO ORDER.

Send for further information. Machinery is run by Steam.

**Questions of the Times.**

Which are the most reliable watches?

American watches, they are driving those of foreign make out of the market.

Which is the best American watch?

The New York watch, made at Springfield, Mass.

Why is it the best watch?

Because it is substantial in all its parts, constructed on the best principles and embodies those improvements which experience has shown to be the most desirable.

Why is the New York Watch so popular?

Because in buying one you are sure of getting a good time-keeper. While purchasing a watch of most other makes is like investing in a lottery—a great many blanks to one prize.

Which is the cheapest watch?

The most economical is the New York watch. For you can get one of these excellent time-keepers for less than it costs in a short time to patch up a poor watch, which benefits no one but the repairer.

Where can I get a New York Watch?

By addressing the long established, practical Watch makers and Jewelers, DEWEY & JORDAN, 433 Montgomery St., San Francisco, who will send you a descriptive price list, including the following styles of movements: "John Hancock," "Gen. Sam. Rice," "Chas. E. Hayward," "Aaron Lugg," "Theo. E. Studley," "Chester Woodworth," "Frederick Billings," "Railway," "John L. King," "E. W. Bond."

**Mining and Other Companies.**

Persons interested in incorporated shares will do well to recommend the publication of the official notices of their companies in this paper, as the cheapest appropriate medium for the same.

**California Fruit Growing Association.**—Location of principal place of business, San Francisco, Cal. Location of property, El Dorado Co. Notice is hereby given, that at a meeting of the Board of Directors, held on the fourteenth day of August, 1877, an assessment (No. 6.) of 83 per share, was levied upon the capital stock of the corporation, payable immediately in U. S. gold coin, to the Secretary, at the office of the company, 331 Sansome Street, San Francisco, Cal.

Any stock upon which this assessment shall remain unpaid on the fourteenth day of September, 1877, will be delinquent, and advertised for sale at public auction, and unless payment is made before, will be sold on Monday, the first day of October, 1877, to pay the delinquent assessment, together with costs of advertising and expenses of sale. By order of the Board of Directors. HORACE JONES, Sec'y. Office, 331 Sansome St., San Francisco, Cal.

**POSTPONEMENT.**—The day for redeeming the stock delinquent on the above assessment is hereby postponed until Saturday, September twenty-second, 1877, and the sale thereof until Monday, October eighth, 1877. By order of the Board of Trustees. HORACE JONES, Sec'y.

**Cherokee Flat Blue Gravel Company.**—Location of principal place of business, San Francisco, Cal. Location of works, Cherokee Flat, Butte county, Cal.

**NOTICE.**—There is delinquent upon the following described stock, on account of assessment (No. 38) levied on the nineteenth day of July, 1877, the several amounts set opposite the names of the respective shareholders, as follows:

Names.	No. Certificate.	No. Shares.	Amount.
Conway, E., Balance of certificate No. 30.	48 shares sold	03	29 81 45
for assessment No. 37.			
Randall, A. S., Balance of certificate No. 41.	102 shares sold	95	167 8 35
for assessment No. 37.			

And in accordance with law, and an order of the Board of Directors, made on the nineteenth day of July, 1877, so many shares of each parcel of said stock as may be necessary, will be sold at public auction, at the office of the Company, Room 1, No. 402 Montgomery Street, San Francisco, California, on Monday, the seventeenth day of September, 1877, at the hour of one o'clock P. M., of said day, to pay said delinquent assessment thereon, together with costs of advertising and expenses of sale. O. H. BOGART, Sec'y. Office, Room 1, No. 402 Montgomery Street, San Francisco, Cal.

**Dolores Consolidated Mining Company.**—Location of principal place of business, San Francisco, California. Location of works, Wilson Mining District, Esmeralda County, Nevada.

Notice is hereby given, that at a meeting of the Board of Directors, held on the seventh (7th) day of August, A. D., 1877, an assessment (No. 2) of twelve and one-half (12 1/2) cents per share was levied upon the capital stock of the corporation, payable immediately in U. S. gold coin, to the Secretary, at the office of the company, 418 California Street, San Francisco, California.

Any stock upon which this assessment shall remain unpaid on the seventeenth (17th) day of September, A. D., 1877, will be delinquent, and advertised for sale at public auction, and unless payment is made before, will be sold on Tuesday, the ninth (9th) day of October, A. D., 1877, at the office of said company, at the hour of 2 P. M., to pay the delinquent assessment, together with costs of advertising and expenses of sale. By order of the Board of Directors. J. W. CLARK, Sec'y. Office Room 2, No. 418 California St., San Francisco, Cal.

**Excelsior Silver Mining Company.**—Location of principal place of business, San Francisco, Cal. Location of works, Potosi District, Lincoln County, Nev. Notice is hereby given that at a meeting of the Board of Directors, held on the fourth day of September, 1877, an assessment of ten cents per share was levied upon the capital stock of the corporation, payable immediately in U. S. gold and silver coin, to the Secretary at the office of the company, 421 Washington street, San Francisco, Cal.

Any stock upon which this assessment shall remain unpaid on the tenth day of October, 1877, will be delinquent and advertised for sale at public auction, and unless payment is made before, will be sold on Tuesday, the twenty-first day of October, 1877, to pay the delinquent assessment, together with costs of advertising and expenses of sale.

T. O'CONNOR, Sec'y, pro tem. Office, 421 Washington street, San Francisco, Cal.

**POSITION WANTED.**

Position wanted as analytical chemist by a graduate of the Laboratory of Fresenius.

Four years' experience. Address, CHEMIST, P. O. Box 884, New York City.

WOODLAND, CAL., Aug. 5th, 1876.

Messrs. DEWEY & Co.—Gents: Your letter containing the patent for my Centennial churn has come duly to hand, and you will please accept my many thanks for the prompt manner in which you attended to the business entrusted to your care, and I will take great pleasure in recommending you to any one having anything to attend to your line. I am having a number of the churns put up, which will be ready for sale in a few weeks. Yours truly, JAMES ROOT.



## Iron and Machine Works.

**PACIFIC ROLLING MILL CO.,**  
SAN FRANCISCO, CAL.

Established for the Manufacture of  
RAILROAD AND OTHER IRON

Every Variety of Shafting,  
Embracing ALL SIZES of  
Steamboat Shafts, Cranks, Piston and Con-  
necting Rods, Car and Locomotive  
Axles and Frames,

Hammered Iron of Every Description and Size

Orders addressed to PACIFIC ROLLING MILL  
COMPANY, P. O. Box 2032, San Francisco, Cal., will re-  
ceive prompt attention. Office: 16 First Street.  
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THOS. PENDERGAST.

HENRY S. SMITH

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MANUFACTURERS OF

## IRON CASTINGS

## and MACHINERY

OF ALL KINDS.

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SAN FRANCISCO.

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## Iron and Locomotive Works,

INCORPORATED.....APRIL 30, 1868  
CAPITAL.....\$1,000,000.

LOCATION OF WORKS:

Corner of Beale and Howard Streets,

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Manufacturers of Steam Engines, Quartz and Flour  
Mill Machinery, Steam Boilers (Marine, Locomotive and  
Stationary), Marine Engines (High and Low Pressure).  
All kinds of light and heavy Castings at lowest prices.  
Cams and Tappets, with chilled faces, guaranteed 40 per  
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Directors:

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Wm. Norris, Wm. H. Taylor, J. B. Haggin,  
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WM. H. TAYLOR.....President  
JOSEPH MOORE.....Vice-President and Superintendent  
LEWIS R. MEAD.....Secretary

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Corner Howard and Beale Streets,

Are prepared to make SHEET IRON AND ASPHALTUM  
PIPE, of any size and for any pressure, and contract to  
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ing pipe with the least amount of material.

Standard sizes of Railroad Car Wheels, with special pat-  
terns for Mining Cars. These small wheels are made of  
the best Car Wheel Iron, properly chilled, and can be  
fitted up with the improved axle and box—introduced by  
this company, and guaranteed to outlast any other wheels  
made in this State.

All kinds of Machinery made and repaired.

JOSEPH MOORE, Superintendent.

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Manufacturers of all kinds of

Wharf and Bridge Bolts, Railroad Trestle  
Work, Car Frames and Bolts, Machine  
Bolts, Set Screws and Tap Bolts,  
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ALL STYLES OF FANCY HEAD BOLTS.  
HOT AND COLD PRESSED HEXAGONAL AND  
SQUARE NUTS, WASHERS, BOLT ENDS,  
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PRACTICAL BOILER MAKERS,

Marine, Stationary and Portable Boilers, Smoke Stacks,  
Hydraulic Presses, Oil or Water Tanks, Ore and  
Water Buckets, Gasometers, Girders, Bridges  
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ALL KINDS OF SHEET IRON WORK.

Repairing promptly attended to at the  
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For Mining and Other Purposes.

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Light and Heavy Castings of Every De-  
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The Only Illuminating Tile Manufactured for Light-  
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Metal Castings, Brass Ship Work of all kinds, Spikes,  
Sheathing Nails, Rudder Braces, Hinges, Ship and Steam-  
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and Valves, Hydraulic Pipes and Nozzles, and Hose Cou-  
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with dispatch. PRICES MODERATE.  
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Manufacture Iron Castings and Machinery  
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## STEAM ENGINES AND BOILERS

Of all sizes—from 2 to 60-Horse power. Also, Quartz  
Mills, Mining Pumps, Hoisting Machinery, Shafting, Iron  
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## REVOLVING FURNACE,

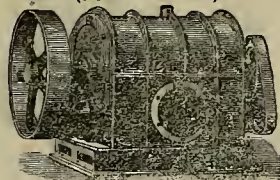
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WARRANTED SUPERIOR TO ANY OTHER

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Is Extensively Used in the East and

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Wherever introduced, because it can be run with less  
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saves labor. WE ASK FOR TRIAL AGAINST ANY  
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Cost of Roasting and Chloridizing 20 Tons  
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One man.....	\$ 4 00
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Wood—2½ Cords at \$3 per cord.....	5 25
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Cost of 20 tons.....\$52 25  
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In a furnace of three or four times this capacity the  
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The furnace is now working successfully at the Poe Con-  
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These goods are specially  
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FARMERS, MECHANICS,  
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Best Material, and in a  
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will convince everybody of  
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And other base metals, or to ores free from base metals.  
It can be adapted to any first-class Gold or Silver mill, at  
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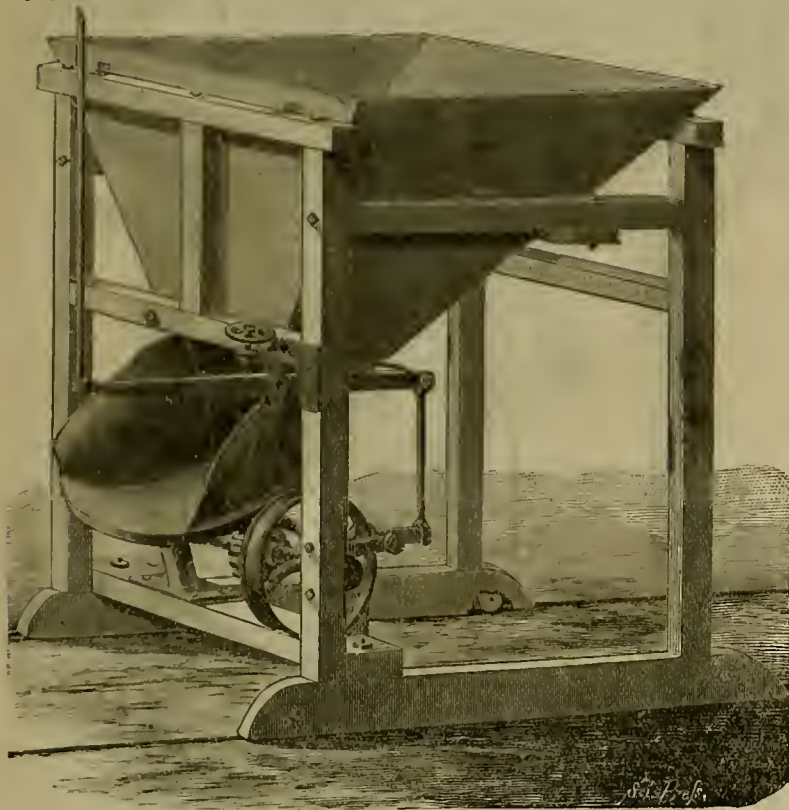
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# \$1,000 Challenge Ore Feeder,

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It may be considered as now fully demonstrated, by careful and long-continued experimentation, that the plan upon which a perfect ore feeder must be constructed is that of the carrier, and not that of the shaking table. Uniform and accurate feeding is not possible upon the latter plan. The ore must be evenly carried, upon a steadily advancing plane or table, to the line of discharge, and there simply dropped. Spasmodic or jerky contrivances will not answer the purpose.

We warrant the machines to give perfect satisfaction, and to be a better and more durable Feeder than any other in the market, and will sell them as cheap as any other of its class.

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O. H. Bogart, 402 Montgomery St., San Francisco, Cal.  
Bardwell, Walter & Co., 405 California St., S. F., Cal.  
Haggin & Tevis, 50 Nevada Block, San Francisco, Cal.  
Eclipse Mill, Independence, Inyo County, Cal.  
Silver King Mining Company, Arizona.  
Gold Stripe Mining Company, Plumas County, Cal.  
Crescent Mine, Plumas County, Cal.  
Hidden Treasure, Deadwood, Black Hills.  
S. B. Schrontz, Del Norte, Colorado.  
Little Anna Mine, Colorado.  
Briggs Bros., Black Hunker, Colorado.

Ontario Mills, Parley Park, Utah.  
Julian Mill, Newcastle, Placer County, Cal.  
St. Patrick Mining Company, New Castle, Placer Co., Cal.  
Bunker Hill Mill, Amador County, Cal.  
Gover Mining Company, Amador County, Cal.  
Talisman Mining Company, Amador County, Cal.  
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The Tulloch Ore-Feeder, after having been in use for about six months in the "Gold Stripe Mine," at Greenville, Plumas County, Cal., has also been superseded by the \$1,000 Challenge Ore Feeder.

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Several first premiums received for Quartz Mill Screens, and Perforated Sheet Metals of every description. I would call special attention to my SLOT CUT and SLOT PUNCHED SCREENS, which are attracting much attention and giving universal satisfaction. This is the only establishment on the coast devoted exclusively to the manufacture of Screens. Mill owners using Battery Screens extensively can contract for large supplies at favorable rates. Orders solicited and promptly attended to.

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All persons, excepting those having the right by purchase from me, are hereby cautioned against using, or making, or selling any device for turning the discharge pipes of hydraulic machines which uses the deflecting force of the stream of water.

Any such device is an infringement of United States Letters Patent, granted to me on the 16th of May, 1876, and re-issued September 10th, 1876.

I have commenced suit against Richard Hoskin for infringing my said patent, and intend to prosecute all parties using such Deflectors without license from me, there being no other way to protect my rights.

Any parties wishing to purchase the right to use this device can do so by making application to me.

HENRY C. PERKINS,  
North Bloomfield Nevada County, Cal.

GUIDO KUSTEL,  
MINING ENGINEER and METALLURGIST.

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For Steam Boilers, Pipes, etc. Best non-conductor of heat in use. It effects a LARGE SAVING OF FUEL, LASTS AS LONG AS THE IRON to which it is applied, and is reasonable in cost.

REFERENCES: United States Government Buildings and the principal manufacturing establishments in the East and on the Pacific Coast; the principal mines and mills in Nevada, etc., etc.

United States and Foreign

SALAMANDER FELTING COMPANY.

PACIFIC BRANCH.

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ASBESTOS STEAM PACKING, made from pure long fiber Asbestos. Indestructible and Self-Lubricating Circulars and Descriptive Pamphlets Sent Free.



DYSPEPTIC—Well, Brown, you used to look just like me; what in the world has caused such a radical change in your appearance?

BROWN—Simply dining at the Palace Restaurant, No. 218 Sansome Street.

FINE DINNERS FROM 5 TO 8 P. M. FOR 50 CENTS

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SUCCESSORS TO EAGLE WORKS MFG. CO.  
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STEAM ENGINES, BOILERS, AND STAMP MILLS  
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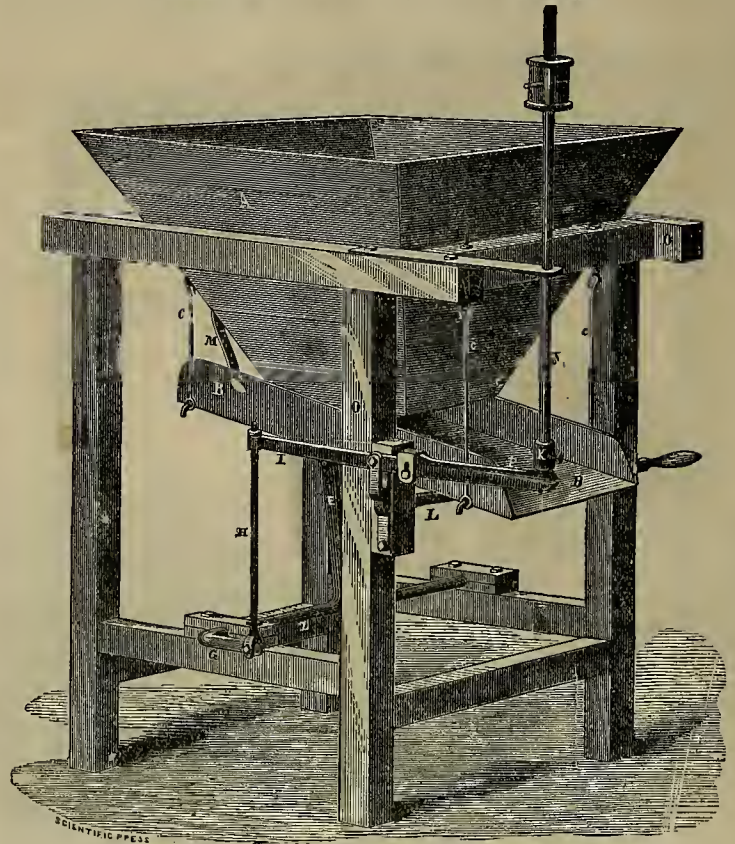
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Tomales; Crescent; Tiffany & Hepburn; Gold Stripe;  
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FRED'K OGDEN, Sole Owner Tulloch Patent,

ROOM 72, NEVADA BLOCK.

Extract from a letter from C. G. Rodgers, Superintendent Green Mountain Mining Co., Plumas County, Septem-  
ber 10th, 1877: After using both the Tulloch and Hendy Ore Feeders, side by side, for eight months, I can candidly  
say, that in my opinion, the Tulloch is much the best machine; it will feed any ore that can be fed by machinery;  
there is nothing about it to wear out, and should anything break, any blacksmith can repair it. Whereas, the Hendy  
machine is wearing from the moment it is started, and when any thing is worn out, or broken, you must have a ma-  
chine shop or foundry to make the repairs. The Hendy Feeders are not in use at the Gold Stripe Mill; they were  
thrown out after a fair trial of some two weeks.

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# MINING AND SCIENTIFIC PRESS.

An Illustrated Journal of Mining, Popular Science and General News.

BY DEWEY & CO.,  
Patent Solicitors.

SAN FRANCISCO, SATURDAY, SEPTEMBER 22, 1877.

VOLUME XXXV.  
Number 12.

## The Thermoscopic Lubricator.

Tyne's thermoscopic lubricator, which was patented through the MINING AND SCIENTIFIC PRESS Patent Agency not long since, is a very ingenious though simple device, entirely different in design from any other thing of the kind. By referring to Fig. 1, of the engraving, its operation will be seen. A represents a glass cup containing the oil. The glass cup is connected with a brass stem or support, B, having a shoulder, B<sup>1</sup>, upon which the cup and packing ring are seated. An upper hollow screw-threaded stem, B<sup>2</sup>, extending into the oil receptacle, and a screw nut, C, under which is another packing ring, are arranged to work on the hollow stem, B<sup>2</sup>, and compress the glass cup tightly with the packing rings on the brass stem or support.

The main tube or casing, D, of the valve for regulating the flow of the oil from the oil cup, screws into the hollow stem or support, B, and is provided with orifices, F and G, and an opening at its lower end, said orifice, F, being for the inflow, and the two latter for the overflow.

The valve, H, is fast on the valve rod, J, and is compressed by a spiral spring on a small seat in the tube, B, immediately below the orifice, F, so the flow of oil is completely cut off until the valve rod, J, is raised by hand, or the sleeve, L, raised, or the thermometer, M, in the base of the cup, expands by a rise in temperature. The valve, I, on the lower end of the valve rod is intended to shorten or lengthen the valve rod, so that the thermometer, when heated, will open the valve, H, sufficiently to allow a moderate supply of oil to flow through the orifice, F.

This device is effective, substantial and economical, insuring positive safety from overheated journals or other friction surfaces of machinery. It can be applied to any machinery, whether stationary or movable, factory, marine or railway, and is applicable to the largest or smallest journals. It is positive in action, and so ingeniously contrived that it cannot fail, under any circumstances, to accomplish its object. It is self-acting and self-regulating, and obviates the trouble frequently experienced from overheated journals. The least heat generated by any extraordinary friction causes the oil to flow as freely as necessary, and the flow of oil is automatically reduced when it is no longer needed. It acts equally well in hot or cold weather, wastes no oil, and never feeds more or less than the desired quantity.

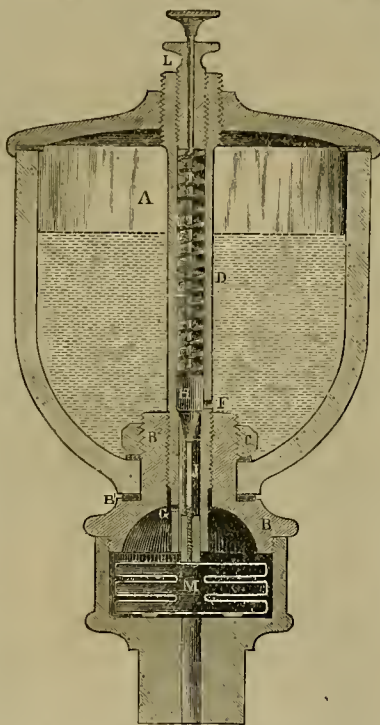
The thermometer, lettered M in the engraving, is a novelty itself, and the many ways in which this ingenious device may be utilized, establish it at once as one of the most useful inventions of the age. It consists of a series of flexible metallic chambers, communicating and connected with each other by means of central stems, so that collectively they constitute a sort of expansive bellows, so delicately made and sensitive to heat that its action is almost instantaneous.

Its power of expansion is only limited by its size and number of chambers employed. Those used in connection with the patent oil cups, at 120° Fahrenheit, will expand double their size and raise a weight of five pounds. This is an invaluable instrument for various uses besides that hereinbefore mentioned. In case of fire, by attaching an electric or other device, it may be made to ring an alarm, and by automatically opening faucets, cause a flow of water to quench the flames; or it may be used as a thermostat, for regulating the temperature of rooms or halls, or in any drying or heating chamber, or in chemicals or liquids where a certain temperature is desired. It might be used on shipboard, where cargoes liable to spontaneous combustion are earned, to insure an alarm before the lives of passengers are sacrificed or valuable property consumed.

In the lubricator a signal alarm may be attached to the thermometer, so, in the event of a journal heating, the expansion of the bellows will raise the valve-rod in the oil cup, and at the same time give an alarm by touching a trigger or by forming an electric circuit, if wires and battery are attached.

Engineers, and all practical men, know the great necessity of having a reliable cup, which will give a constant and even supply of oil. The novel arrangement and contraction of the sleeve and valve-rod in the device is especially to be admired, as the exact amount of oil is regulated at all times. Its use prevents any trouble from neglect to oil a journal, as the automatic device regulates the flow in accordance with the necessities.

In case of friction, or an insufficient supply of oil, the least warmth from the journal will so affect the sensitive little thermometer in the base of the cup as to immediately expand it and raise the rod which opens the valve near the bottom of the cup, and allow a larger quantity of oil to descend to the journal, thereby supplying additional lubrication when needed. In case the journal keeps continually warm, which is sometimes the case, thereby raising the valve and allowing the escape of too much oil, the valve on the bottom of the rod may be screwed in, thus shortening the rod so the thermometer will barely touch it, and the flow of oil can then be regulated, as before described, by means of the sleeve L. The temperature at which the



TYNE'S THERMOSCOPIC LUBRICATOR.

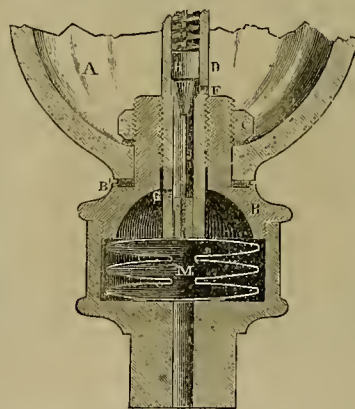
thermoscope will act can be regulated by this valve—on the lower end of the valve-rod. If the oil becomes congealed by cold, the hot air that expands the thermoscope will ascend the tube and liquefy the thickened oil, so it will descend in sufficient quantity for lubrication.

This device is the invention of E. D. Tyne, and is manufactured by Giovanni & Benerscheidt, Union Brass Foundry, 417 Mission street, San Francisco, and sold by the manufacturers and principal dealers in machinery and hardware throughout the Pacific coast.

A BIG GOLD BAR.—There was on exhibition, this week, at the office of August Weihe, corner of Montgomery and California streets, a bar of gold bullion weighing about 225 pounds avoirdupois. The bar is the product of the Spring Valley gold mining company's mine at Cherokee Flat, Butte county, and was originally intended for exhibition at the State fair, but the company determined upon converting it into coin, and it was accordingly sent to the refinery. The bar weighs 2,532.43 ounces, Troy weight, and its value is \$50,750.78 gold and \$81.25 silver. The Spring Valley company carries off the palm for big bars of gold, several very large ones having been made by it in the past few years.

## Importing Quicksilver.

California being the largest quicksilver producing country in the world, it seems strange to think of the article being imported here, especially at the prices quoted. Moreover, what came here was sent from Hongkong, China, to which place we export large quantities. The causes which led to this reversal of the natural order of things are not generally known, and are thus spoken of in the *Bulletin*: Until within three years at has been a comparatively easy matter to regulate the quicksilver trade in the interest of producers, and it has been so controlled. However, within the above interval the number of claims has been wonderfully increased, resulting in an unusual depression in price, compared with monopoly years. Those who had been successful in controlling the price and product when there were but few mines, thought they would again try the experiment. It was known that Flood & O'Brien, the largest local consumers, were running short of stock; that the spot supply was light, and that it was generally a good time to put up the price. So the wise men got together, and conferred with each other—not once, nor twice, but many times. All the elements could not be harmonized—at least the owners of one mine refused to go into the arrangement. The preliminary proceedings, however, were sufficiently successful to establish a temporary advance of 33 1/3 per cent., the price having been nominally raised from 45 cents to 60 cents per pound. It is claimed that Flood & O'Brien bought largely up to 50 cents, to the extent of 4,000 flasks, for future delivery. They then withdrew from the market, and went to Hongkong. There they found quicksilver selling for \$61 per picul, or 46 cents per pound, and they bought 5,000



THERMOSCOPES EXPANDED BY HEAT.

flasks as rapidly as possible, the price advancing with each fresh purchase.

The Chinese and other resident operatives, anticipating other orders from San Francisco, went into the market and bought right and left. As a result of these operations, we find that the Hongkong market rose from \$61 on the 25th of July, to \$97 on the 3d of August, a gain of 60 per cent. inside of 10 days. The stock at Hongkong, on the 25th of July, was 13,000 flasks, and it was sold and resold several times during the following fortnight, some of the buyers paying dearly for their experience. There were no more orders from San Francisco, and, of course, nothing to sustain the market. The first installment of Flood & O'Brien's purchases in Hongkong, consisting of 1,000 flasks, arrived by the *Oceanic* on Sunday, and was immediately ordered to be sent to the mines. The moral of the whole story is, that the next time our quicksilver sharps attempt to do a sharp thing, they had better take the honanza people into their confidence, or make terms with large holders of quicksilver in foreign markets.

COPPER is selling in Liverpool at £67 15s. to £68 for good ordinary brands; £68 10s. to £69 for special brands; 12s. 6d. to 13s. per unit for ore; and 13s. 3d. to 13s. 6d. per unit.

## Academy of Sciences.

The regular meeting of the California Academy of Sciences was held on Monday evening last, Mr. Hyde in the chair. There were no contributions to the cabinet, and there were no original papers presented, but Mr. Christie read a translation of an article on a method of determining the melting point of metals and of non-conducting substances. Mr. Lockington, following the example of Mr. Christie at a preceding meeting, read a paper collated from the publications of the last two months on variability in species, confining the range of his remarks to fish, a department of natural history in which he is a specialist. The idea of this is to keep the members posted as to recent researches in science. Several of the members, who read the various scientific periodicals, make a brief summary of those things that appear of importance, and read this digest in case no original articles are presented. Dr. Gibbons gave expressions to his delight at papers of this class, and he hoped the specialists of the Academy would continue to devote a little time to their preparation. They form an epitome of what is passing in science, and are interesting to the members whose scientific enlightenment is susceptible of direction and development. The President thought such papers would be productive of greater interest in the proceedings of the Academy, attention being given to a fusion of the hard technicalities of scientific description into popular language. Dr. Kellogg concurred in the utility of information thus diffused, and felt confident that a thorough scientific man will not experience much difficulty in reducing his terms to the comprehension of the average intelligent listener. He related an anecdote of a lady untutored in the niceties of scientific description, who discovered a mollusc, and made a drawing of it, and wrote about it with such graphic luminosity that Dr. Jewett, to whom the description was sent, decided that it ought to be forwarded to the Smithsonian Institute; and there it was deemed so admirable that it was determined to publish it; and probably the example which this lady gave will be turned to account as an accompaniment of severe technical descriptions. Dr. Gibbons said this habit of collating what is written by others has the value, in the hands of the competent, of purging the sincere scientific mind from the abuses of whimsical invention. He had himself been fooled by the celebrated moon story, and ever since that time he had read with suspicion all newspaper accounts of discoveries, and had not satisfied himself that Mars has satellites.

CALIFORNIA SCHOOL LAND DECISION.—Copp's *Land Owner* for September, contains the following decision of the Interior Department in the case of Rasmus Jackson *et al. vs.* The State of California: The decision in the case of Selby *et al. vs.* The State of California was not intended to cover all invalid selections which had been certified to the State prior to the settlement of the pre-emption claimant, but it referred only to that class of selections which were voidable on account of the 16th and 36th sections, in lieu of which they were made, being within the unadjusted limits of a Mexican grant. The decision in the case of Taylor *et al. vs.* The State of California, holding that State selections of lands, held in reservation by an unadjusted Mexican grant, are void *ab initio*, is not in conflict with the Selby decision as one refers to the condition of the land in lieu of which selections were made, and the other to the condition of the land selected. The second section of the Act of March 1st, 1877, confirms to the State of California all indemnity school selections which had been certified to the State prior to its passage, except those lands occupied by *bona fide* settlers prior to certification, and excepting also the class named in the first proviso thereof, which are not confirmed, but simply subject to the right of purchase from the Government by the innocent purchaser from the State. The decision in the case of Selby *vs.* The State of California should govern in the adjustment of selections made subsequent to and not confirmed by the Act of March 1st, 1877.



## CORRESPONDENCE.

It is the desire of the editors of this journal to be liberal toward all correspondents, and therefore statements and opinions are frequently published, on the authority of the writers, for which we do not assume responsibility.

### Notes from Colorado.—No. 1.

[By our own Correspondent.]

#### Boston and Colorado Smelting Works at Black Hawk.

On approaching the depot of the Colorado Central railroad at Black Hawk, the attention of the tourist is attracted by a forest of smoke stacks that tower high up over the extensive smelting works of the Boston and Colorado company, located on the right of the road as you approach the depot, and filling the whole neighborhood with their smoke. Group after group of these buildings are passed as the train slows up, and you are at once surprised at their number, size and the extent of grounds covered by them.

The enterprise of the Boston and Colorado Smelting Company was inaugurated in the spring of 1867. Prof. N. P. Hill, for many years Professor of Chemistry in Brown University, after having spent some time visiting and examining the mines and ores of Colorado, and also making several visits to Swansea, Wales, organized a company in Boston, under the title of the Boston and Colorado Smelting Company, with a full paid up capital of \$275,000.

One smelting furnace and one calcining furnace, with the necessary crushing machinery, were completed in the fall of 1867. The first smelting was done in January, 1867. From that time to the present there has never been a day when the works have not been in full operation. Since then three additional smelting furnaces have been added—one in 1869, one in 1871 and one in 1875. Seven calcining furnaces have also been added to the establishment, as follows: One in 1868, one in 1869, two in 1870, one in 1872 and two in 1874.

Until the summer of 1873, the operations of the company were confined entirely to concentrating the ores into matte, containing gold, silver and copper. This product was sold to Vivian & Sons, at Swansea, under a contract made before the works were built. At this time Vivian & Sons terminated the contract by notice of a large reduction in price for matte, a reduction so large as to make it impossible for the company to continue its business on the old plan without a corresponding reduction in the price of ore. The result of this movement was to force the company into the separating and refining business, which has added a most important branch of business to the industries of the State. The capital was increased to \$500,000 by the payment of \$225,000 into the treasury, and since that time not less than \$750,000 have been constantly employed in their business.

The company was fortunate in securing the services of Mr. Richard Pearce, who had an extensive experience in a similar business at Swansea. The refining works were put into full operation in October, 1873, the first shipment of silver bars being made about the first of November of that year. While I was in the works, I had the pleasure of seeing Mr. Pearce weighing and numbering the last 10 silver bricks of the week's run. The last brick numbered 2,163, making about 130 tons of pure silver shipped from these works since November 1st, 1873. I afterwards saw these 10 silver bricks piled up on the sidewalk fronting the express office in Central City, on their way to New York.

#### The Separation and Refining

Of the gold followed closely upon that of the silver. This was done at first by making rich alloy of gold and copper, which was sent to the works of the company, erected in Boston for this purpose. Here the gold was separated from the copper by the use of sulphuric acid, and a large quantity of sulphate of copper was manufactured.

During the past year a great improvement in this process has been made by Mr. Pearce, and all the gold produced in the establishment is now sent direct to the mint in bars of a high state of fineness. The Boston works, owing to this discovery, have been abandoned.

#### This Great Enterprise

Is still under the general management of Prof. N. P. Hill, with R. Pearce, Superintendent of the processes, and A. Von Schultz, Assayer. The works and ore yards cover a large tract of ground—perhaps four acres. The smelting house is 50 by 160 feet. The storehouse for the richer ores is of stone, 80 by 150 feet. Two crushing-houses, each containing Blake crushers and Cornish rollers, have a capacity of 80 tons per day. A building, 75 by 250 feet, is furnished with eight calcining furnaces, each 40 feet long. The gold and silver refining rooms are 75 by 200 feet, containing two calcining furnaces, two melting furnaces, the fine grinding Bulthoff mill, a leaching-room, 50 by 100 feet, and melting and refining rooms for gold and silver. Fifty-two tons of ore are smelted per day. The daily expense for wood and labor amounts to \$500.

The following general

#### Description of the Process

Is copied from the Denver *Mirror*: "The low-

grade ores having been broken into lumps the size of hen's eggs, 75 to 100 tons in a heap, are piled upon a square layer of wood, which being fired and consumed in about 12 hours, thoroughly ignites the mass, which is covered with fine-screened ore to make combustion less rapid and prevent melting. This roasting process continues two months, until all the sulphur has been consumed that is contained in the sulphurets of copper and iron. Richer gold ores and those too fine to work in this way, are roasted in reverberatory furnaces. The ores (after-roasting) are next taken to the smelting furnaces, the charges for which are made up of five or six different kinds of ore, so combined that they flux each other, and produce the best possible results. This combination is determined in the laboratory, and requires the greatest skill and knowledge of ores. A reduction in the average time of smelting a charge of ore from eight hours to six, is equivalent to a saving of \$75,000 per annum. No fluxes, properly speaking, such as lime, flour, spar or iron are used. In this process of smelting the ore is separated into a matte and slag—the amount of matte representing five per cent. of the original amount of ore smelted. This matte carries all the gold, silver and copper contained in the ore, every 20 tons of ore being concentrated into one ton of matte. After crushing, the matte is next treated by an ingenious process of roasting and leaching, and the silver extracted. The residue, after eliminating the silver, is again put into matte (by smelting), and from this the gold is extracted by a process not in use by any other smelters in the world; in fact, being original with Mr. Richard Pearce. A full description of this process would require much space, with scarcely a chance of being intelligible to the general reader. The separation is performed without the use of acids or chemicals, the gold being taken directly from the gold matte by furnace processes. Silver amounting to a weekly production of \$26,000, is sent to the New York mint, of an average fineness of .999, as shown us by the returns from that office. It undergoes no further refining, but is stamped as fine silver, with a charge to the company of one-fourth of one cent per ounce."

I cannot better close this lengthy statement of this most important establishment, than by giving the value of hullion and matte produced during the nine years it has been in operation, amounting to ten million one hundred and fifty-six thousand and sixty-two dollars!—produced as follows:

Years.	Amounts.
1868.....	\$ 270,886 00
1869.....	489,875 00
1870.....	652,329 00
1871.....	848,571 00
1872.....	996,954 00
1873.....	1,210,670 00
1874.....	1,638,877 00
1875.....	1,947,000 00
1876.....	2,097,900 00
Total amount.....	\$10,156,062 00

The Boston and Colorado smelting works, under the management of Prof. Hill, have already achieved a world-wide reputation for completeness of arrangement and unsurpassed success in treating the most difficult ores, for which the people of the Centennial State may feel justly proud. Prof. Eggleston, of Columbia College, who has visited all the reduction works of Europe, speaks of this establishment as the most complete in the world.

Prof. Hill says he can purchase California ores at San Francisco quotations, pay transportation to his works at Black Hawk, Colorado, for reduction, and make money by the operation; and he proposes establishing an agency at San Francisco for this purpose as soon as he can make reasonable arrangements with the railroad companies.

#### Gregory Lode.

This celebrated lode is on the north branch of Clear creek, Gilpin county, was discovered on the 6th day of May, 1859, by John H. Gregory. Its location is within the limits of the mining town of Black Hawk, containing a population of about 1,000 inhabitants.

Since its discovery it has been opened and worked by different companies for about 3,000 linear feet.

The Black Hawk company, formerly owning Nos. 1, 2, 3, 16 and 17 west, sold, in September, 1874, the first three claims, worked to a depth of 600 feet, and equipped with a 14-inch Cornish pump, to Briggs Bros.; also leased the Consolidated Gregory mine, comprising claims 4, 5, 6, 7 and 8 west, thus giving them the ownership of 540 feet, and the management of 1,040 feet. The Briggs shaft is now down 900 feet, finding richer ore than ever before.

#### The Smith & Parmlee Company

And the New York company were consolidated some eight years ago, bringing 800 feet under the management of B. T. Wells, Esq., who has proved a successful Superintendent.

The Narragansett company's property has been operated more or less under leases, of late, this bringing all of the lode under three managements.

The main shaft of the New York and Colorado company's property, under the management of B. T. Wells, is down about 550 feet, steadily improving as it is deepened. The workings are drained by a six-inch Cornish pump. This mine easily supplies mill ore for the 40-stamp mill situated over the mine. The hoisting works, pump and mill are driven by our engine. From 30 to 40 tons of ore per day are broken. I failed to copy the last annual report of this mine, but for the year 1875, the gross amount of \$67,310.65 was realized, with a large reserve of ore unbroken. Only the low-

grade ore is treated under stamps; the rich or high grades are sold to the Boston and Colorado smelting works.

The Briggs Bros.' shaft is about 900 feet deep, and levels are to be run westward through the property managed by them. Their production keeps 50 stamps employed, and about \$35,000 are annually received for smelting ore.

The total production of this celebrated lode has been from \$4,500,000 to \$5,000,000. This estimate is made in part by the known production of some years, and in part by comparison of the known with the unknown.

If this very valuable lode could be consolidated and all worked under one management, it would be one of the best paying mining properties in the State—saving at least \$100,000 annually. And this would be but a small item compared with the increased productions of the mines under co-operative management.

The work on this lode gives employment to about 300 men; the buildings are large and substantial, and the whole appearance of the works business-like and prosperous.

#### Bottail Lode.

The mouth of the celebrated Bottail tunnel is located but a short distance from Briggs Bros.' mills. It was completed in 1872, cutting the mine about 500 feet in depth and 1,150 feet from the mouth of the tunnel. The present workings are below the mouth of the tunnel level, which has been drifted the length of the property. The main shaft is now 140 feet below the tunnel, or 640 feet below the surface.

The machinery of the mine is all under ground, at the end of the main tunnel, over the mine. It consists of two large boilers, which supply steam for the hoisting machinery, pump and air compressor. The smoke-stack is built through a shaft and is 520 feet high, 250 feet of it being a three-foot-square brick stack, and the remainder an iron stack two and a half feet in diameter. The hoisting machinery for the cage is as substantial as wood and iron could make it. In working this mine the interior arrangements are such that cars loaded with two tons of ore are loaded in the levels, drawn upon the cage by mules, sent to the tunnel level, and drawn by mules through the tunnel to the sorting floor, without handling. The output of the mine now supplies 115 stamps, or 115 tons of mill ore per day.

I copied the following statement from the books of the company. From the report of the Trustees of the Con. Bottail gold mining company for the year 1876, presented at the annual meeting, January 25th, 1877:

	Production.
Bullion from stamp mills.....	\$ 232,206 70
Ore sold to smelters.....	44,147 47
Received from tributaries.....	1,253 25
Received from rents.....	320 00
Interest.....	308 37
Total.....	\$278,235 79
Expenses.....	\$ 156,555 87
Mining.....	51,154 21
Drainage.....	14,358 46
Superintendence.....	5,600 04
Taxes and incidentals.....	2,093 38
Expenses.....	1,567 55
	\$231,259 09
Profit for the year 1876.....	\$46,975 80

I had the pleasure of visiting the fine mill of Ravalph & Sullivan, in lower Black Hawk, the capacity of which consists of 50 stamps, which were thundering away on custom ores from the Bottail, Fisk and other mines, crushing from 35 to 40 tons per day. In making up these statements, I have drawn liberally for facts and figures upon a valuable little work of Cushman & Waterman, entitled "The Gold Mines of Gilpin County, Col." G. M. M.

#### Methods of Mining at Mineral Hill.

The six car-loads of ore received at the Lemon mill and shipped from Mineral Hill, says the *Eureka Sentinel*, includes some very rich rock, and if it existed in large quantities would make that locality famous. The selected chlorides assay from \$300 to \$2,000 per ton, and represent the summer's work of the owners. They have made very favorable terms with the proprietors of the mill, those gentlemen guaranteeing a return of 80 per cent. on the assay value. The battery was started up yesterday evening, and it will be put through at the rate of 10 tons per day. A portion of the ore was extracted from leased ground belonging to the English company, and they receive as a compensation one-fourth of the net proceeds. The formation at Mineral Hill is a hard dolomitic limestone, permeated throughout with numberless small crevices and caves, and in these latter the ore has been deposited. When found it invariably runs up into the hundreds, and sometimes thousands of dollars per ton, and richly rewards the miner for his expenditure of time and labor. The work is carried on by small companies, generally by two men, who follow a stain or trace in the hard rock until it opens into one of the caves mentioned above. Sometimes months of hard labor ensue before the miner finds his bonanza, but the smallest of them rarely fail to recompense him for his work. A ton of chloride, assaying \$1,500 or \$2,000, is a very pretty pile, and compensates him for his weary toil. There is a glorious uncertainty attending this particular kind of mining that fascinates those engaged in it, and spoils them for the dull, prosy day labor that obtains in more extended operations. Those following it are of the best of their class, energetic, hopeful and skillful workmen, whose an-

hition soars above the \$4 per diem that they could readily earn if they were willing to work for corporations. It is pleasant to record that those who have devoted their time and labor to that field in the locality spoken of, have been liberally rewarded for their enterprise, the average returns far exceeding ordinary wages, and in many instances amounting to snug fortunes. Finances run low for a time both with the storekeeper and miner at the hill; but as soon as the boys get out enough ore to justify a crushing, the little village on the hill takes to itself airs of prosperity. Long-standing accounts are settled, new supplies laid in, and a short holiday indulged in; after which they soberly settle down for another season's choloriding. Under the late superintendent's administration, and owing to his being restricted by Chancery Court orders, the system of leasing the company's ground was abandoned; but since the change in the affairs of the company, we understand that Capt. Plummer will allow the miners to resume their work on the same favorable terms that heretofore obtained. The new superintendent is well liked, and has the esteem of the community in which he has cast his fortunes, and he is determined to give all the boys a chance to employ their time profitably both to themselves and the owners of the property.

#### Salmon City Mines, Idaho.

From a letter from Salmon City, Idaho, by a correspondent of the Salt Lake *Tribune*, we take the following items concerning the mines of that region:

Now, as to the mining, both gold and silver: One cannot say too much in its favor, provided the same facilities for shipping and reducing our rich ores were granted us that bless and curse the miners of Utah and Nevada. The principal mines are situated at the mouth of Jordan creek, on the Yankee fork of the Salmon, and on Bay Horse, Lyon and Killiknick creeks, direct tributaries of the Salmon river. On an air line the two districts are about 20 miles apart, but about 40 by the trails. The mines on Jordan creek are the oldest, and, therefore, will receive my attention first.

The Charles Dickens, owned by William Norton & Co., is gold-bearing, and, so far, second to none in the Territory. The lucky owners have pounded out, in a common band mortar, over \$80,000 in the past year, and still have plenty of rich ore in sight in their working and plenty on the dump. They are not excited and do not go wild over their God-send, but are working steadily, as if no rich bonanza ever trod their with its boundless wealth. They have sunk a shaft to the depth of 50 feet, and, also, run a tunnel and tapped their shaft, so that, at the present writing, they are at a depth 70 feet and on good ore, "free gold to the naked eye" all through it. What the average assay is I cannot say, but it is good.

The Ukonnow and Gen. Custer mines come next. They are both on the same lode, and are really not well defined between walls, but are, nevertheless, the finest bodies of high-grade black sulphurets ore that it has been my fortune to see. The ore lies in sight on the surface, tons upon tons, that assay all the way from \$250 to \$2,700 in silver, and also a large percentage of gold. But that curse to any mining camp (litigation) will impede the progress of the Gen. Custer. The mine is owned by rival claimants, who have set forth their wrongs before his Honor of the Third Judicial District of this Territory. When it will be settled, no one knows.

The next is the Hidden Treasure, which certainly rivals its Utah namesake for surface wealth. It is situated on the Estes mountain, nine or ten miles from the mouth of the Jordan, and the main camp. The ore is black sulphurets of silver, and is owned by Capt. Varney & Co.

They have shipped a few tons to the Banner mills, across the mountains in Alturas county, by pack animals; in fact, every pound of rock that is shipped from this camp must go by the same slow and tedious process, as there is no road and no likelihood of there being any this season.

The next that came under my observation are the mines on the Bay Horse, Lyon and Killiknick creeks. The mines, or rather prospects, are situated in easy distance from Salmon river, about 80 miles from the city; are high-grade base-metal ores and have been recently discovered. A good natural wagon road can be found to within 15 miles of the camp, where a very little work can finish the road to the camps on Bay Horse. The district is well watered and well timbered, and all the natural advantages so necessary to the welfare of the camp are to be found. The ore assays from \$50 silver and 80% lead to \$900 in silver and a large percentage of copper and lead. The principal prospect, so far, belongs to George Harland, J. B. Hood, R. Beardsley, Charles Blackburn, Timothy Cooper, S. Blackburn, Jessie McCaleb and others. The distance from Bay Horse to Killiknick is 15 miles and is one continuous belt of limestone, slate and sienite, and contains mineral wherever prospected.

Now the only drawback is transportation and the necessary capital to build a smelter. The distance from the mines to the railroad is about 375 miles, consequently the miners are compelled to go slow, shape their course as events may dictate, and "wait for the wagon," but, in the meantime, sink on our mines and find out their extent and value, so they can invite the co-operation of capitalists.



## MECHANICAL PROGRESS.

## Captain Eads' New Dredge.

Captain Eads, the engineer of the jetties in the mouth of the Mississippi, found the dredging devices which were available unfitted for his work. Peculiar conditions which exist at the mouth of the jetties render the use of a dredge boat which can buffet the waves a necessity. Therefore he devised a dredge of his own, and is now having it constructed at Pittsburg, Pa. We are enabled, by a description in the *American Manufacturer*, to compile a few points on the machine:

The principal difficulty which has interfered with the successful pumping of sand or silt from the beds of streams has arisen from the difficulty of proportioning the quantity of solid matter to the volume and velocity of the stream which is made to transport it. A given volume and velocity of water through the suction pipe is capable of sustaining in suspension a definite amount of solid matter. If too great an amount of solid matter be admitted into the suction pipe, the stream is unable to transport the excess, the pipe becomes clogged, and the pump ceases to throw either water or sand.

To remedy this difficulty, the end of the suction pipe which rests upon the bottom of the river is curved into the form of a flat scraper, four feet in width, which is armed with a steel plate, forming a bit, which may be fairly compared to the bit in a carpenter's plane. To prevent this bit from taking too deep a cut in the sand, the end of the pipe is supported on an adjustable horizontal plate, which rests upon the sand in advance of the bit or scraper. To insure the proper quantity of water entering the suction pipe with the sand, the horizontal plate just described forms the bottom of a water chamber into which the water is received five feet above the scraper. The water is forced into the chamber by the atmospheric pressure resulting from the vacuum created by the pump. The end of the suction pipe, therefore, is continually drawing in a stream of sand four feet wide, and a stream of water of the same width, both entering together immediately above the scraper; the discharge of the water chamber being immediately over the stream of sand which is passing in over the top of the scraper. The scraper is designed to be moved at a speed of from 10,000 to 15,000 feet per hour.

By a very simple device the plate which separates the sand and water as they enter into the end of the suction pipe is made adjustable, and as the whole end of the apparatus rests upon the plate on the bed of the stream, it is only necessary to raise the scraper or lower it to alter the quantities of sand and water which are being drawn into the pipe. The depth at which the scraper is cutting the sand is constantly known by the operator, and can be quickly altered so as to take in a stream of sand 12 inches deep and a stream of water four inches deep at the same moment, or these proportions can be reversed so as to take in a stream of water 12 inches deep and of sand four inches deep, or the cutter can be raised so as to bring it completely above the sand, in which event the suction pipe will receive nothing but water. The centrifugal pump in the Bayley is the largest one of the kind ever constructed in the United States, and is known as the Andrews cataraet pump. The suction pipe is 27 inches in diameter, of one-quarter inch wrought iron. It is attached to the hull of the boat in a recess four feet wide, and extending from the stern 25 feet forward.

The boat is built entirely of iron, and is considered a very superior job. It is about 200 feet in length over all, and is propelled by two horizontal high-pressure engines, each 7 feet stroke and 21 inches diameter, turning wrought iron shafts and wrought iron wheels 28 feet in diameter. The paddles are of wood, 11 feet long and 24 inches wide. The boat is surrounded by an iron bulwark about five feet high and set back two and a half feet from the side of the hull. The tanks have an estimated capacity of 1,000 tons of dredged material and water. Two overflow gates are provided for the tanks, which allow the water to escape when they are filled to the overflow level, the sediment settling to the bottom. The pump is estimated to be capable of throwing 3,000 barrels of water per minute.

**THE RESISTANCE OF SHIPS.**—Mr. William Froude, at a late meeting in London, read a highly scientific but most interesting paper, the object of which, says *Iron*, was to show the effect produced on the resistance to a ship's motion by the lengthening or shortening of the flat middle body between the bow and stern. The results were based upon experiments made at Chelton Cross with models having the same ends, but different lengths of parallel body inserted amidships. By separating the effect of the frictional skin resistance, which was proportional to the wetted surface, he showed that the increase or diminution of the power required to propel a ship, in consequence of the alteration of the length of the parallel body, depended very largely on the coincidence, or want of coincidence, of the wave-crests traveling alongside the ship with the points at which the reduction of breadth by the fine lines began. When this diminution coincided with a wave-crest there was no loss but rather a gain of speed, while when it coincided with a wave-hollow, the loss of speed, or increase of resistance, was considerable.

## Hints on Joining.

In "Andrews' Guide to Church Fitting" are some hints for the fine carpentry of church interiors, which may apply just as well to other branches of tasteful joining: The main stay of constructive woodwork is the mortise and tenon. A piece of woodwork which can be put together without glue, nails or screws, and serves its purpose, is an ideal work of construction; but this is not always possible. Another principle of construction is that every piece of wood should be so placed that it can swell or shrink without injuring itself or displacing any other piece. This is maintained in an ordinary paneled door, provided no moldings are inserted. Still another principle is that inter-joints should be avoided, whether for molded work or not, for the reason that shrinkage causes all joints to open. No piece of wood should be used unless the straight grain of the wood can be seen through its full length in one place. Inserted moldings should be avoided as far as possible; and all moldings for panel-work should be worked on the styles and rails. It is a general principle, observed in the best medieval joinery, that all moldings on rails which are horizontal should butt against the styles; and that styles should be either plain or should have moldings stopped before reaching the joints with the rails. In practice, all rail moldings may be worked the whole length of the stuff used; and if muntins (which are the middle styles) are used, the moldings may be cut away to the square wood before the mortise is cut which is to receive the tenon of the muntin. Thus the moldings will butt against the square sides of the muntin. All the parts for a door thus made can now be got out by machinery, and the door will be fully constructive in every sense of the word. There is no obstacle to this in the way of cost. The dovetail is a constructive device; and the dowel is admissible in places as a substitute for the mortise and tenon. Tongue and grooving is a legitimate device, both for ends and sides of boards. Beveling the edges of the pieces thus joined is better than beading. The best way to construct large panels is to make them of narrow strips, tongue and grooved, and beveled at the joining edges. Such panels will never "draw." The shrinkage will be divided between all the joints. Solid table-tops should never be fastened with glue or screws, but should be secured with buttons fastened to the under side of the top, which travel in grooves cut in the framework to allow for expansion and shrinkage. These are but few of the principles to be observed in doing the best woodwork.

In all kinds of lumber the heart should be rejected. All boards cut on a radius from the center to the periphery of a tree will remain true, while all others have a tendency to warp or crack. The first are called "quarter-sawn." It is a peculiarity of oak that the best grain is found in quarter-sawn boards. It is only in these that the "silver-grain" is seen. This consists of a ribbon of very hard substance which grows out from the center of the tree. It is for this reason that oak is the most enduring wood; it has a grain two ways. All woods crack in the direction of a radius from the center. Quarter-sawn oak cannot crack.

**STILL TALKING KEELEY.**—The Philadelphia papers are still talking the Keeley motor language just as vigorously as though the world had not pronounced it meaningless. It sounds like old times to read the following: "The operation merely consists, then, in a motion of the lever already described; and certainly last night its results were wonderful, and demonstrated that the power is made from hydrant water and ordinary air, no chemicals about it, and it will drive an engine and transmit power. The vapor passes from the machine into a steel shell and into a condensing apparatus, whence it goes to a small tube and thence to the engine. The valves were all opened to show the machine was clear, air introduced, and the lever was lifted, the first move showing 1,750 pounds pressure on the gauge to the square inch; and though the chamber for condensing was open, the current did not blow out a match held over it. With six and one-half pounds air pressure the gauge indicated 5,200 pounds to the inch, and then 6,700 on the third trial. On the fourth, it lifted a large lever (weighed) registering 5,000 pounds dead weight. The vapor was turned into an explosion chamber, and the cap flew off with a report like a rifle, frightening half those present; and lastly, a five-horse power engine, with three-fourths-inch stroke and 24-inch fly-wheel, was driven at 680 revolutions to the minute. The skeptical engineers were convinced that the power was there, and that it could be applied. The present machine cost \$60,000. One of the engineers said they had produced 14½ vacuum on one experiment; and 15 is perfect, as all engineers know. A public test will be given shortly." The last sentence is especially familiar.

**A MECHANIC'S LABOR AND REWARD.**—Palissy, a French surveyor of the fifteenth century, was seized with an ardent desire to discover the Chinese mode of enamelling porcelain. In the pursuit he wasted his substance, burnt his furniture as fuel for his furnace, and even sold his clothes. But he succeeded, and made a large fortune. At 90 he died in the infirmity.

**REVIVING.**—All the mills of the Allentown Rolling Mill Company are at present running with a full complement of hauls, having received a large order which is to be filled within the next two or three weeks.

## SCIENTIFIC PROGRESS.

## Mineral Growth Again.

A few months ago we had a paragraph concerning the "Growth of Minerals," a subject with which Mr. Readwin perplexed the young Royal Mineralogical Society of England. We read now, in English papers, that this gentleman, since his last paper on this curious subject, has visited the museums of Copenhagen, Stockholm, Christiania, Kongsberg and Loudon, in search of corroborative evidence of recent mineral growth at ordinary temperatures under ordinary conditions. He took some of his best examples with him, and submitted them to many eminent mineralogists. The silver specimens at Copenhagen, for size, variety and beauty, surpassed all others, probably, in the world. The silver growths, out of calcite, epidote, fluor and argenteite, were almost numberless. Some were old, others recent, and a few even infantile. He likewise found argenteite and electrum growths; the latter both out of quartz and pyrites, and including some very bright and positively very recent. Bismuth growth was also observed, and indications of recent gold growth. The Stockholm collection had the reputation of being in part the oldest in the world. There were many Kongsberg silver growths, more or less tarnished, of great size and beauty, and some small ones of recent origin; also tarnished electrum growths, a few comparatively bright. At Christiania there were recent copper growths out of fluor, foliated electrum growths out of quartz, and silver growths out of Kongsberg argenteite. At Kongsberg there was the most varied interesting collection of silver specimens it was possible to see, and silver growths in abundance, including flat plates of silver growing at the edges. At the British museum were a few small electrum growths, which he believed were recent. He added a list of his chief "home growths" since May 5th, some of which he described as of a very remarkable character.

## A Deep-Sea Sounder.

At the recent meeting of the British Association, Sir William Thompson described an apparatus he had invented to make deep-sea soundings, not with a view to exploration, but for ordinary purposes of navigation while a ship was at full speed. A glass tube, filled with air, was hermetically sealed at the top, but opened at the bottom, and prepared with red prussiate of potash. It was placed into a brass tube, which was closed at the bottom, but allowed the free ingress and pressure of water from above. The brass tube was partially filled with sulphate of iron, and wherever this iron came into contact with the interior of the glass tube it turned into a Prussian blue. The pressure of the water compressed the air, and forced the sulphate of iron up the glass tube, according to the depth to which it descended. The glass tube, part of which retained its original color, was then measured on a scale, and thus the depth of the sounding was indicated. For the purpose of being lowered into the sea, the tubes were attached to the end of a long piece of piano-forte wire, which weighed about 14 pounds per mile, and was capable of bearing a strain of 220 pounds. At the extreme end a 22-pound sinker was fixed. The absence of any friction from the wire facilitated rapidly both in sinking and hauling in. Some tubes were exhibited which had been recently used in taking soundings on board the White Star steamers *Britannic* and *Germanic*, during a voyage to New York and back. The soundings were made when the ships were going at full speed, at depths varying from 10 to 100 fathoms, and were perfectly successful.

**THE FLESH OF FRUITS.**—It is generally supposed that the flesh of the fruit provides the first food for the germinating plants of its seeds. Such, however, remarks the *Journal of Chemistry*, is not the case, for here, as in other cases, the first nourishment is drawn from the seed alone. The flesh of the fruit hears no relation to the embryo; it is a kind of outcast substance or excretion of the plant. In most of our cultivated fruit trees, too, the great mass of this flesh is the result of cultivation. Thus, wild cherries possess so little flesh that they do not repay the trouble of plucking. In the mountains of Pontus grapes are found so small that they are not worth eating; and the wild apricot, and often, likewise, the wild peach, possess no flesh at all, the former, indeed, being like a leathery two-valved capsule. The flesh of the fruit of most of our cultivated fruit trees is analogous to the enlarged roots of the turnip and beet, and similar plants, and is simply the product of cultivation, which is much sooner lost again under neglected circumstances than it was originally artificially produced. One of the most able French hotaists, Professor Lecoq, of Clermont Ferrand, instituted numerous experiments with various wild plants to induce them to form fleshy roots, and he was almost invariably successful. Just as it is the task of the agriculturalist to increase the volume of his roots, so it should be the aim of the fruit gardener to increase the flesh of the pome, stone, berry fruits, and the substances stored up in the cotyledons of nut fruit.

**PRactical INSTRUCTION.**—The *Iron Age* says that anybody with whom there yet lingers a doubt whether summer schools of science may not mean picnics and a good time generally with a few scraps of learning by way of a sandwich, may be reassured by the actual hard work required of certain students belonging to the School of Mines, Columbian College. The students referred to were 12 volunteers from the class of '78 in the department of engineering, of which W. P. Trowbridge is Professor in charge; Henry S. Munroe being assistant Professor, with this summer school under his immediate care. Last month the 12 went to Drifton, a town in Luzerne county, Pa., and there were set at work in a coal mine—the actual work of the miners, handling a pick, drilling the blast holes, loading the cars and the like. Among the lighter work required of them were the various constructions needed in the mine for supporting or lining the openings, and similar details of ordinary mining labor. Several days were thus spent, the proprietor of the mine, Mr. E. D. Cox, and the regular miners in his employ, all taking a hearty interest in the scheme. Each of the students was afterward required to furnish drawings and an essay from the notes taken during their labors. The experiment in education is regarded as highly successful.

**AMERICAN PLANTS ABROAD.**—M. Boreau, in a paper read before a French scientific society, gives some curious instances of the rapid distribution of certain foreign plants through the medium of water. The *Potamogeton digitaria*, an American grass, first discovered near Bordeaux in 1824, has spread widely in the neighboring departments, and has got as far south as Toulouse. Another grass from southern climes, the *Stenotaphrum Americanum*, is spreading its powerful roots in the sands at the mouth of the Adour. The *Anacharis Canadensis* has invaded the lakes and rivers of England, Scotland, Belgium, Holland and Germany. In Belgium and elsewhere drains have been rendered useless, and canals have been completely obstructed by these plants; and in many large sheets of water it suffers no vegetable life but its own to exist. Since 1871 this formidable stranger has been gaining a foothold in France; it has been found on the outskirts of Brest, and it swarms in the waters of the Paris parks. Another plant of the same family, the *Stratiotes aloides*, introduced in 1825 in the neighborhood of Mans, has followed the course of the river Sarthe, and abounds in the neighboring lakes.

**FLUID CARBONIC ACID IN ROCKS.**—The committee appointed by the British Association "for investigating the conditions under which liquid carbonic exists in rocks and minerals," recently reported that, according to the method of determining the exact temperature at which carbonic acid in the cavities of rocks and minerals became gaseous, the temperature known as the "critical point," at which fluid carbonic acid was found, was 39.92° Centigrade. The acid was found to be contained in minute cavities of the rocks and minerals, and experiments had been tried upon sapphires, garnets, and other precious stones, and the result had been the discovery in these of carbonic acid. A curious fact had also been ascertained—i. e., that certain bubbles in the fluid cavities approached heat, whilst others receded from it. The changes of the carbonic acid from gas to liquid and from liquid to gas were found to be produced by the heightening and lowering of the temperature; and in some of the cavities neither the gaseous or liquid form of the acid was to be found, the cavities being filled simply with water.

**MR. RUSKIN'S CABINET.**—The minerals and precious stones in the museum at Walkley now form a collection of marvelous beauty, and are almost as varied as they are numerous. They are being arranged by Mr. Ruskin in 20 groups namely, silica, oxide of titanium, oxide of iron, alumina, potassa, soda, magnesia, calcium, glucina, fluorine, carbon, sulphur, phosphorus, tellurium, uranium, tin, lead, copper, silver and gold. The founder of the institution, in his "Deucalion," informs us that "the mineralogical collection is fully described and explained in the catalogue, so that any young people may begin their study of it without difficulty, and so chosen and arranged as to be comprehensible by persons who have not time to make themselves masters of the science of chemistry, but who may desire some accurate acquaintance with the aspects of the principal minerals which compose the world;" also, that "every one of the specimens is chosen for some special character, and the points characteristic of it are described in the catalogue."

**CHLOROPHYLL**, or the coloring matter of plants, has been found by M. Fremy (as our readers may know) to consist of two principal constituents: one yellow, and called by him *phyloxanthin*, and the other a dark bluish-green, which he calls *phyllorocyanic acid*. Having further inquired into the manner in which the substances occur in the organic tissue, he concludes that "the coloring matter of leaves is a mixture of phylloxanthin and phylloxyanate of potash."

**THE electrical illumination of the Lyons railway station** is being completed. They are now using twelve electric lamps. This number will be enlarged successively to twenty-four lamps, fed with one light-producing and one light-distributing machine. It is believed that twenty-two horse power will give a power of 2,400 gas-lamps, using 100 liters each per hour.



Table of Highest and Lowest Sales in S. F. Stock Exchange.

Name of Company.	Week Ending Aug. 30.	Week Ending Sept. 6.	Week Ending Sept. 13.	Week Ending Sept. 20.
Alpha.....	111	107	111	124
Andes.....	2,40	5	4	3
Baltimore Con. Belcher.....	5,40	71	54	62
Belmont.....	850	750	850	750
Best & Belcher.....	183	180	181	200
Bullion.....	72	61	61	71
California.....	4	31	34	4
California.....	304	27	224	283
Challenger.....	361	321	361	361
Challenger & Potosi.....	5	4	6	5
Confidence.....	850	750	850	750
Con Imperial.....	3,95	3,55	3,55	4,05
Con Virginia.....	50	550	550	550
Crown Point.....	421	34	421	45
Eureka Con.....	7	9	7	9
Exchequer.....	250	200	250	200
Gen Thomas.....	171	141	191	181
Gila.....	800	700	800	700
Golden Chariot.....	92	84	104	94
Gould & Curry.....	550	500	550	500
Hale & Norcross.....	1,05	1,15	1,15	1,20
Hussey.....	133	91	133	116
Justice.....	51	41	61	61
K K Con.....	5	4	5	4
Kentuck.....	250	200	250	200
Kosuth.....	750	500	1,00	1,10
Lady Bryan.....	1,40	1,10	1,10	1,10
Lady Wash.....	100	50	100	50
Leviathan.....	1,90	1,80	1,75	1,85
Leeds.....	700	550	1,10	1,55
Manhattan.....	350	300	350	300
Meadow Valley.....	101	90	850	500
Mexican.....	101	91	110	101
New York Virginia.....	350	300	400	400
Northern Belle.....	171	171	171	171
Overman.....	27	24	29	27
Pacific.....	1,15	1,15	1,10	1,10
Phil Sheridan.....	1,40	1,10	1,10	1,10
Panther.....	100	50	100	50
Poorman.....	400	250	200	200
Prospect.....	171	15	17	15
Rock Island.....	200	150	200	150
Seg Belcher.....	42	37	40	42
Sierra Nevada.....	41	3	4,65	4,30
Silver Hill.....	3	2	4	3
South Chariot.....	2,50	1,10	1,10	1,10
Sucon.....	850	750	850	750
Trojan.....	550	480	61	61
Union Con.....	12	10	11	11
Utah.....	300	20	450	300
Wells Fargo.....	101	92	101	101
Woodville.....	101	92	101	101
Yellow Jacket.....	101	92	101	101

## Sales at S. F. Stock Exchange.

FRIDAY, A. M. SEPT. 14.	240 Andes.....	650/700
710 Alta.....	3,350/3,400	1,500
185 Andes.....	700/750	2,550/2,600
275 Alpha.....	111/113	310
450 Bullion.....	81/83	125
600 Con Imperial.....	900/950	850
940 Crown Point.....	4,20/4,40	1,110
750 California.....	221/223	300
50 Chollar.....	3,00/3,10	400
140 Con Virginia.....	311/313	450
380 Caledonia.....	3,85/3,95	500
100 Confidence.....	5,60/5,70	1,800/1,850
415 Cordillera.....	1,10/1,15	81/85
1020 Exchequer.....	81/83	65
440 Gould & Curry.....	91/93	1,100/1,150
940 Hale & Norcross.....	1,10/1,15	1,700/1,800
940 Justice.....	130/131	300
1680 Julia.....	4,00/4,10	300
50 Kentuck.....	51/53	310
585 Lady Wash.....	1,01/1,03	875
300 Leviathan.....	200/210	700
100 Mexican.....	101/103	700
50 New York.....	600/610	700
100 North Con Vir.....	600/610	700
90 Overman.....	241/243	1,545
95 Ophir.....	161/163	1,545
100 Occidental.....	100/105	200
50 Prospect.....	50/55	200
850 Peytona.....	900/950	500
270 Sierra Nevada.....	4,70/4,80	20
510 Savage.....	71/73	150
100 Sucon.....	1,10/1,15	750
365 Silver Hill.....	3,10/3,15	101/103
450 Trojan.....	650/660	550
100 Union Con.....	110/111	100
45 Utah.....	110/111	100
50 Wells Fargo.....	300/310	525
670 Yellow Jacket.....	101/103	110
AFTERNOON SESSION.		
315 Andes.....	2,00/2,10	300
325 Belmont.....	81/83	235
250 Belcher.....	61/63	300
220 Bullion.....	81/83	300
130 Best & Belcher.....	171/173	200
420 California.....	3,00/3,10	750
445 Crown Point.....	4,10/4,15	750
650 California.....	2,81/2,83	1,000
85 Chollar.....	34/36	100
730 Con Imperial.....	850/900	580
200 DeFrees.....	1,800/1,900	500
5210 Endowment.....	3,20/3,30	300
50 Eureka Con.....	450/460	300
250 El Dorado S.....	450/460	300
1080 Exchequer.....	81/83	255
250 Gila.....	1,01/1,03	1,100
575 Golden Chariot.....	1,10/1,15	300
370 Grand Prize.....	1,10/1,15	300
380 Gould & Curry.....	91/93	1,100
170 Grand Central.....	1,10/1,15	300
300 Hussey.....	450/460	300
350 Hornet.....	1,050/1,100	850
110 Hale & Norcross.....	1,10/1,15	1,700
100 Independent.....	1,10/1,15	1,700
200 Jackson.....	61/63	1120
70 Julia.....	101/103	300
100 Kentuck.....	51/53	310
100 Leviathan.....	200/210	700
100 Mexican.....	101/103	700
100 New York.....	600/610	700
100 North Con Vir.....	600/610	700
90 Overman.....	241/243	1,545
95 Ophir.....	161/163	1,545
100 Occidental.....	100/105	200
50 Prospect.....	50/55	200
850 Peytona.....	900/950	500
270 Sierra Nevada.....	4,70/4,80	20
510 Savage.....	71/73	150
100 Sucon.....	1,10/1,15	750
365 Silver Hill.....	3,10/3,15	101/103
450 Trojan.....	650/660	550
100 Union Con.....	110/111	100
45 Utah.....	110/111	100
50 Wells Fargo.....	300/310	525
670 Yellow Jacket.....	101/103	110
MONDAY, A. M. SEPT. 17.		
50 Alpha.....	131/132	100
790 Alta.....	41/42	100
350 Andes.....	81/83	235
110 Belcher.....	61/63	300
25 Best & Belcher.....	181/183	110
1120 Con Virginia.....	320/321	300
430 California.....	3,00/3,10	750
20 Confidence.....	40/41	100
110 Crown Point.....	4,10/4,15	750
225 Caledonia.....	3,85/3,95	500
1855 Chollar.....	34/36	100
300 Con Imperial.....	850/900	580
930 Gould & Curry.....	91/93	1,100
290 Hale & Norcross.....	1,10/1,15	1,700
300 Julia.....	2,40/2,42	200
1855 Justice.....	151/152	100
300 Jackson.....	61/63	1120
200 Kossuth.....	150/151	100
100 Leviathan.....	200/210	700
310 Lady Wash.....	1,01/1,03	875
100 Mexican.....	101/103	700
300 North Con Vir.....	600/610	700
105 Overman.....	241/242	1,500
270 Ophir.....	171/172	100
100 Occidental.....	100/105	200
110 Occidental.....	85/90	100
110 Sierra Nevada.....	41/42	100
90 Savage.....	71/72	100
50 Sucon.....	1,10/1,15	750
365 Belcher.....	361/362	100
300 North Con Vir.....	600/610	700
140 Silver Hill.....	3,00/3,05	100



# MINING SUMMARY.

The following is mostly condensed from journals published in the interior, in proximity to the mines mentioned.

## California.

### AMADOR.

**THE MONTERICHARD.**—Amador Dispatch, Sept. 15: We understand that steps are now being taken to recommence work on the Monterichard mine, which has been lying idle for sometime. It will be managed under the supervision of Mr. Jas. Meehan.

**TALIMAN.**—Amador Ledger, Sept. 15: It may be safely said that there is not a more energetic mining manager in the county than John Treghian, who is in charge of the Taliman. In the face of many discouragements he took hold of the Taliman about a year ago. He had unbounded confidence that there was a genuine mine there, and, in spite of all adverse circumstances, he determined to explore the mineral vein which he knew existed in that region. Months have elapsed since work was resumed on the abandoned claim; the pick of the mine has been made, the heart of the mine has been discovered, and the mine is now opening up a fine body of paying ore. A 10-stamp mill has been steadily working for months, and the increased richness of the rock discovered of late gave birth to hopes that the large outlay of money in putting the property in working shape would soon be repaid. Just at this juncture the water in the Amador canal failed, and the supply for the Taliman was a short time in danger of being cut off. For 30 or 40 days more, it was thought, would put the company out of debt, or nearly so; but the motive power gave out, and no prospect was presented other than shutting down till the commencement of the wet season. Treghian, however, was equal to the emergency. The Keystone mine, just beyond, had a prior right to the water in the ditch. Several hundred inches of the canal could be diverted to the Taliman to feed the Keystone. There was no telling how long this supply would last, nor how soon the Keystone would have to take to steam. Treghian went below and succeeded in making arrangements with the owners of the Keystone for 40 inches of their water, the Keystone works to be run partly by steam; Treghian agreeing to pay the difference in the cost of the water on account of the failure of the Taliman for running his mill. By this expedient the Taliman is still pounding away at the rock, with the very best results.

**PURKITT.**—Sinking operations continue, developments being of a very cheering character. The ore body holds its own in size, and improves in grade steadily. A five-foot ledge, we are told, has been discovered in a part of the mine where there was little expectation of finding it. Everything points to booming times at the opening of the winter. Eighty men are at work enlarging the capacity of the ditch, and putting things in shape.

**SOTO.**—Tibbets has sold one-eighth interest in the mining claim recently discovered by him and Tucker on Tucker hill, Sutter creek, to S. Manon. We have not heard the consideration paid for it. The mine is being worked right along, and promises to pan out hugely.

### BUTTE.

**GRAVEL MINE.**—Oroville Mercury, Sept. 15: Butte county abounds in good gravel mines. The only trouble is, it is difficult to reach them, and to get water to them, with which to carry on work. One of the best in all respects is to be found east of T. B. Jones's place, on the West Branch. It is 600 yards long, and runs back into the mountains a long distance. Three tunnels have been run, 50 feet deep, and in each they get excellent prospects. A flume can be made, 400 feet long, that will put 3,000 inches of water to the chute and 50 feet of head. The certainty is one of the best claims in the country, is easily opened and will last for years, with good dump and good pay all of the time. In less than five years \$100,000 will be paid for this piece of ground. How it has happened that miners did not gobble it up before is more than we can understand.

### CALAVERAS.

**RICH QUARTZ DISCOVERY.**—Calaveras Chronicle, Sept. 15: We learn that Mr. Harryhausen, a miner well known in the upper country, has lately made a very rich quartz discovery in the vicinity of Mosquito gulch. Mr. Harryhausen, while prospecting between Mosquito and the Cold Spring house, picked up a very rich piece of "float." He subsequently discovered the ledge from which the ore came, and we understand that work upon it is developing a vein of almost incredible richness. The claim is undoubtedly an extension of the well-known Grasshopper mine. The discovery has created intense excitement in Mosquito, now the liveliest camp in the mountains.

**NEW MACHINERY.**—A large quantity of machinery, designed for the Grasshopper mine, at Mosquito, passed through town a few days since. A couple of new engines and boilers are to be put up, for pumping and hoisting purposes, respectively, the machinery being now all on the ground. There is no question but that the Grasshopper is a good mine, and it would have given a favorable account of itself long ago if it had had half a chance. The company now owning the mine have abundant means, and are putting everything in tip-top condition before attempting to work it. Considering that mining is generally the worst conducted business in the world, it is really refreshing to see so gratifying an exception to that rule as is afforded by the Grasshopper company.

**GRASS MINE.**—Mining operations are temporarily suspended at the Grass mine, as the water has failed to reach the water. New shafts and reels are being put in, however, and we understand that about 100 feet of the shaft, which needs repairing, will be attended to. During the suspension, everything will be put in proper shape for active operations during the coming winter. The mine is kept free of water by running the pumps with steam.

**GRASSHOPPER MINE.**—The mine in Chile gulch, is about completed, the only work remaining to be done being the setting up of the stamps. The mill will be ready for operations whenever water can be obtained to run it.

### INYO.

**MINNETTA BELLE.**—Coso Mining News, Sept. 15: Ore stoping is still being prosecuted, with the most flattering result as to output and prospects for continuance of the ore body. The work of development on the Union is being driven ahead with extraordinary success, some fine bodies being disclosed. The prospect in the Keystone is also very flattering, some good ore being already developed. The deep tunnel, which fully develops this large ledge, is making good progress. Three shifts of men are employed. In other portions of the mine the usual activity is apparent, and the work of exploration being rapidly made. The mill is running steadily on ores from Snow's Minnetta. In a word, everything is running splendidly.

**IMPORTANT SALE OF MINES.**—On the 11th instant an important sale of mines in Lookout was consummated. J. J. Gunn, Martin Mee, W. T. Grant, John Crough and Geo. Ellis sold to Sheldon Collins, R. T. Ashman and T. P. Rudlett, of New York, the St. George, St. Louis, Light-house, Atlantic, Safety, Panamint, and Alpha veins, situated near Snow's canyon, Lookout district. These purchasers intend to work these mines in connection with the Emma, Gertrude and Dictator, situated in close proximity thereto. They have purchased the five-stamp mill erected nearly three years ago in Panamint canyon by R. C. Jacobs. The same has been taken down, and is now being removed to Snow's canyon, where it will be re-erected and running upon the rich ore of those valuable mines in less than 60 days. The work is being done under the supervision of Mr. Ashman, a practical mill man. The company has plenty of money to work with; is not incorporated, but will operate and do business as a private concern, the work of developing the mines being for actual dividends to be derived therefrom, not for wild stock speculation. Some 25 men are now employed in grading, transporting machinery and working in the

mines. We have been endeavoring, in our humble way, for the past two years, to attract the attention of capitalists to these mines. A number have made inquiry in regard to them, but on bearing they were gold-bearing, gave little attention to them, most everybody having silver-lead on the brain. We believe future developments will pay the mines to be the most valuable of any in this mineral belt.

### NEVADA.

**COPPER.**—Grass Valley Union, Sept. 15: We understand that Mr. John Treghian is about to resume work at his copper mine, called the "Fox," situated near Storm's ranch, in this township. It is claimed that the ore contains about 25 per cent. of copper, and the lead being large, profitable working can be done. Nevada county has plenty of gold, silver, iron and copper in her soil and rocks. A century from now, the people then here will about begin to know something about the resources of this section of the country.

**THE PROVIDENCE MINE.**—Nevada Transcript, Sept. 15: The most energetic mining men we have had in this part of the county for many years are the owners of the Providence mine. Many of our people think differently, simply because they know nothing, in fact, about what the owners have had to contend with. They bought the mine about three years ago, and have been working it ever since. They developed the mine, and found they had an immense ledge, varying in size from 2 to 40 feet, or an average of 30 feet. They have worked thousands of tons of the quartz, but it has not paid by mill process, judging from the looks of it, what it ought to be. The ore is of the most rebellious character, and they have done all in their power to get the best results. They have expended thousands of dollars in trying to find some process that would be applicable to their particular case, and up to this time we do not believe they have succeeded. The ore is most decidedly the worst to work ever found in the State. They have bravely continued on in the mine, and have at last been rewarded in finding a process that will pay. The Providence is down 800 feet, and the ledge averages 20 feet in thickness, all in granite formation. They have never had a foot-wall, but a perfect hanging-wall. A short time since they resumed work on the 600-foot level, which had been extended 800 feet. Almost immediately the quartz changed and was in a perfect slate formation, showing the richest ledge of rock. They are now in about 925 feet, 25 of which is on a ledge of between four and six feet thick, and the rock is very rich in free gold and sulphurets. A gentleman who visited the mine a few days ago assures us that he could see millions of specks of gold all along the ledge, and the rock was very rich in sulphurets. This rock can be worked by ordinary mill process without the least trouble, and as soon as water can be got to run the mill, the Providence will take out gold in immense quantities, and none will rejoice at the good luck of the owners more than the people of this city.

### PLUMAS.

**IRAMA.**—The company prospecting on Mill creek, south of Quincy, struck a fine ledge recently, 30 feet below the surface. The rock prospects very well. Times are lively in Greenville and vicinity. The mines generally are prospering. On Soda creek the Plumas National mill will start in a short time. The Wisconsin mill, at Wolf creek, will start in about a week. The new Rush creek mill has been running for some time, and the prospects are flattering. The extraction of the rock is being done by the Orizaba Ridge company are still working away at their tunnel, with buoyant hopes of making a rich strike. It is rumored that a rich strike in gravel has been made at Clermont hill. In the Bull Frog mine the owners have struck a fine ledge that prospects well. The Green Mountain mine, near Crescent, is paying well as usual. Standard, the crack gold amalgamator of Plumas, and Emmons and his partner, near Greenville. They think they have "struck it big."

### SIERRA.

**NORCROSS.**—Mountain Messenger, Sept. 8: J. H. Miller and partner, mining opposite Ladies' canyon, recently found a piece of gold worth about \$100. Their claim is nearly opposite Frank Beaver's place, on the South fork. **FAST WORK.**—The main tunnel of the Bald Mountain company was advanced 40 feet last week, which is unprecedented for so large a tunnel. The gravel is as rich as ever.

**PIREAZ.**—The shaft of the Pileocene is still in pipe clank, and going down slowly, owing to the closing of the bore where it is in clay, necessitating frequent reaming out to give room for the poles to work.

**MINISO.**—A gang of Chinamen have gone into the river under Durgan bridge for the purpose of working the ground. They take the wheels, flumes, etc., of the men who sunk for the bents.

**GOVERNOR STAR.**—The Golden Star mine, below Albany, is again working their Burleigh drill, running their tunnel further in for the shaft. The gravel they had a week ago did not prove to be the channel.

### TRINITY.

**IN A NEW PLACE.**—Trinity Journal, Sept. 15: Fred Haas will open his mining claim near Junction City in a new place this winter. The cut will be run into the field and flat on which the old Dacey house is standing. If there is anything to be judged by surface indications, we should say that Fred is preparing to open one of the best mining claims that Trinity county can boast of.

### TUOLUMNE.

**THE DRAPER.**—Cor. Tuolumne Independent, Sept. 15: Work on the Draper, formerly known as the old Gilson claim, is progressing rapidly. The mine is owned by Thomas Whitto, but the machinery is being put on it and the mine worked by the Soulsbyville company, who, after prospecting it for a stated time, will have the privilege of purchasing it for \$10,000. It is, however, the prospect does not please and they refuse to buy, the whole reverts to Mr. Whitto. As yet, there are but six men employed, and these are actively engaged in cleaning up the debris which has accumulated during years of inaction. Much of the top soil having washed down and filled everything with mud, but little can be seen in the mine for mud and water but in a week from now the water will be off, and the mud cleaned up, so as to enable an examination of the mine to be made. The machinery on it consists of pumping gear and hoisting works, and is somewhat different from that in general use. The machinery is driven by a 34-foot water wheel, which not only works the powerful pumps, but does the hoisting, too. A full stream of water is not necessary to work the pumps, but is needed when they want to hoist. They have it so arranged, however, with levers and gates, that the man at the brakes can, by a single movement of his foot acting on a lever, start on or off the required amount. Contracts are being let to work the mine, and soon we may expect to see the puffing steam engine, or listen to the roar of the noisy water wheel.

**SOUTHERN MINE.**—As active and busy as ever. Four carpenters are employed, and work on the mill is progressing rapidly. The mortar block, for the new five stamps in course of erection, is in place, and soon five more stamps will be added to the original 10, making in all 15 stamps, with cast-iron batteries and everything complete, even to a rock crusher. The sulphurets are being saved, and a gentleman by the name of Mr. Morrell is erecting machinery to extract the gold, which experiment has been so often tried, but always resulted in failure to make them pay. We understand that he has the privilege of working the sulphurets for six months, when the whole will revert to the company, at cost. Descending the mine, we examined in their winter supply of wood for the steam engine, and the many levers, which are constantly arriving, present a busy scene; two, five and six-horse teams, with

double-acting wagons, carrying from four to five cords of pine wood each, arrive daily from above Northrup's, while half a dozen smaller teams come with perhaps three or four loads a day from the ranches close by. Such an immense pile of wood has accumulated that, for convenience, they have laid a track, and intend to lay another to get at it handy.

## Nevada.

### WASHOE DISTRICT.

**DE FREZ.**—Gold Hill News, Sept. 19: On the third, or 21st level of the mine, the ledge is 8 to 10 feet wide, carrying low-grade ore. In the stopes below the second level, about 150 feet north of the main shaft, very rich ore was found, which is liable to be struck at any time by the men working on the third level. An additional force has been put on, stoping out the richest ore. The four-stamp mill of the company has started up, and in a week or two regular bullion shipments will be made.

**LEVATHAN.**—Owing to the hoisting or galloways frame giving way on Monday morning last, work in the mine is temporarily suspended. No serious damage was sustained in the accident.

**LADY BAYAN.**—Some little delay has been experienced in finishing up the details of the machinery, but the whole will be completed shortly. The new hoisting engine is a duplicate of that of the Caledonia, and is one of the best of its capacity in this section. The pumping engine is also of the latest and best pattern.

**MEXICAN.**—The north drift of the 1000-ft level is steadily advancing in good ore indications. The Mexican and Ophir joint mine, at the 1700-ft level, is making good progress downward with the aid of the Ingersoll drill. Rock very hard.

**GOULD & CURRY.**—The connection of the north drift, at the 1700-ft level, with the Con. Virginia gives good ventilation, and is gradually making the north drift of the mine affected by sinking the main incline is resumed.

**SAVAGE.**—It will take about a week or 10 days more to put in the new pump rods and plumb up the pump shaft, after which it is expected that the water will be more easily conquered. Meanwhile a baling tank is employed to raise the water and send it out through the Gould & Curry, and with the assistance of the Hale & Norcross pump, water is kept out of the mine.

**OVERMAN.**—At the 400-ft level, the main drift south, to connect with the Caledonia, is steadily advancing, with its face in bird's-eye porphyry, carrying occasional streaks of quartz.

**CALEDONIA.**—The drifts north, at the 1400 and 1000-ft levels, are still driving ahead, both in very favorable vein matter, the last mentioned showing considerable improvement over last week.

**ORUIT.**—The drifts north and east, at the 1000-ft level, are advancing in hard blasting rock. The south drift, at the same level, is in soft ledge matter.

**HALE & NORCROSS.**—The pumps continue fighting nobly against the chronic flood, and when the Savage pump aid shaft is again in good trim, the combined forces are expected to reduce that water very speedily and effectually.

**SILVER HILL.**—The new incline pump works splendidly and has been very effectual in reducing the water.

**CON. VIRGINIA.**—The usual daily yield of 550 tons continues to be contributed from the 1200, 1300, 1400, 1500, 1550 and 1650-ft levels. The ore breasts and stopes at all points are looking and yielding finely, and twice the amount of ore is being taken out of the mine. The stopes and breasts east and west, at the 1650-ft level, are looking splendidly, and more and more rich ore is developed as the sill floor is advanced southward. The main drift west from the C. & C. shaft, at this level, is being continued toward the west wall of the ore channel, and the face is in hard-blasting ore, which will mill about \$40 to the ton. This drift is running straight to connect with the Consolidated shaft, which is being run in the same direction from the 1550-ft level. A small engine is placed in the 1550-ft shaft, so that the sinking is being conducted without the aid of the surface engines, or interfering with the workings above. A branch drift is also being run from this station to facilitate working the south ore body. Drift connection with the Gould & Curry at the 1750-ft level, recently completed, affords most excellent and much needed ventilation. The connection made in the Consolidated ground, and the Gould & Curry drift being 10 feet the lowest, the Consolidated drift is being continued south above it for a sill floor, in order to run the ore out to the C. & C. shaft. Cross-cutting from this drift will be commenced forthwith, and better ore is expected to be met with, that in the drift not being of a high grade, owing to the work of the lower outskirts of the horse head in the level above.

**YELLOW JACKET.**—At the 2200-ft level the main drift east is in 315 feet. The main south drift is in 275 feet, 28 feet having been added; the face is in quartz and porphyry. Nineteen feet have been added to the length of the main drift north from the mine, giving a total of 104 feet. The face of the drift is in ledge porphyry, with streaks of quartz. No other work of importance is being done in the old mine, the prospecting operations being confined to this level. Very little water is met with in either drift.

**BELCHER.**—The main drift south at the 1000-ft level is being steadily pushed forward, with its face in porphyry and quartz. Nothing new developed by the prospecting operations at the 1000-ft level near the Segregated line. The connection between the joint air shaft and the Crown Point at the 2000-ft level of the latter mine is being completed, and the shaft is being discontinued at present in order to make some necessary repairs to the timbering of the same. This shaft and incline has reached to within 50 feet of the 1000-ft level. When that level shall be sufficiently advanced, it is proposed to make a raise-up to the bottom of the incline, sending a drill hole ahead to tap and gradually draw off the water in the incline.

**UTICA.**—At the 1000-ft level, where the work of the mine is at present concentrated, a large amount of effective work has been and is being done. On the southerly portion of the level a splendid vein of solid quartz, 97 feet in width and 300 feet in length, is developed by the main drift south, and several cross-cuts east and west from it. The whole of it is in low-grade ore, which would mill \$10 to \$12 to the ton, and the average.

**CALADIA.**—Daily yield 600 tons, keeping the mills all steadily running as usual. The ore breasts and stopes of the 1500 and 1550-ft levels continue their rich showing and regular yield, and the 1000-ft level shows especially well both in quality of ore and in constantly increasing quantity to the south, east and west. The 1050-ft level is also opening out richly in all directions, and the various cross-cuts, stopes and breasts show more ore in sight than is needed at present. The north branch from the C. & C. drift at the 1750-ft level, is nearly into the ore vein, and at the 1840-ft level the south drift is advancing in hard blasting ground. The amount of rich ore exposed in this mine is simply fabulous, and yet its extent is not fully developed by any means. It certainly is good for dividends for many months to come.

**FOR SCATES & GEORGE DOWDAYS.**—Work at the new combination shaft is being pushed forward more actively than ever, an additional shift of men being put on. A station is being cut out at the 200-ft level for a cross-cut through the ledge at that point to the west wall. The east wall is well defined, and shows some very fine looking quartz lying near to it. This is being assayed, and it is expected that by the time the drift reaches the west wall, good milling ore will be developed.

**JACKSON.**—Daily yield, 450 tons. The face of the lateral drift, south from the east cross-drift at the 1150-ft level, is showing good bunches and streaks of ore, and a good development in that line is anticipated at almost any time. The upper part of the 1000-ft level continues in good ore. The drift at it is in the 1000-ft level shows improvement in both quantity and quality of the ore, and the water in the mine sunk below this level is being slowly drained by the Silver Hill mine. The ore breasts and stopes of the upper producing levels are looking and holding out well.

**HORSTMAN.**—Owing to making certain necessary surface improvements, but small progress has been made in sinking the main shaft during the past week. The flow of

water is steady, but does not materially impede progress.

**HELIOS.**—The retimbering of the shaft has been completed, and preparations are being made for resuming work in all directions. The shaft is in splendid condition.

**CHOLLAR-PORTER.**—Daily yield, 75 tons, from the old ore sections. The main drift east at the 1755-ft level, toward the Chollar-Norcross-Savage combination shaft, has, together with the main Chollar shaft, been undergoing necessary repairs to the timbering during the week. This drift is within 700 feet of reaching the combination shaft, and can be made to connect with it as soon as the Suro tunnel can.

**UTAH.**—At the 1150-ft level the main drift south is in 425 feet, with the face in hard-blasting rock, resting on the conglomerate. The south drift is in 140 feet, in about the same sort of material. The incline vein is steadily being continued downward in favorable working ground. Water increases somewhat, but is easily handled.

**CROWN POINT.**—The connection being completed between the main drift south at the 2000-ft level of this mine and the Belcher air shaft is an important and very advantageous one in the way of ventilation, as well as of drainage. Some fair grade ore continues to be extracted from the old upper levels.

**EXCHICQUER.**—The combination drift on the 2003-ft level is making fair progress in vein matter, without any material change since our last report. The east cross-cut on the 2000-ft level is making good progress in very unobstructed ore in the way of ventilation, as well as of drainage. Some fair grade ore continues to be extracted from the old upper levels.

**BEST & BELCHER.**—Good progress continues to be made in sinking winze No. 2 below the 1700-ft level. The rock is very hard, but grows softer. The drift connection from the Gould & Curry to the Consolidated Virginia, through the Best & Belcher, is of great benefit in the way of ventilation.

**IMPERIAL CONSOLIDATED.**—Work in the south winze from the 2135-ft level is going on as usual. A station is being cut out on this level for the purpose of starting an incline whiz between the Imperial and Alpha ground. The main work of the mine is confined to these two points.

**UNION CONSOLIDATED.**—The repairs to the drift eastward at the 1300-ft level are being pushed forward to completion. The machinery, and the joint cross-cut east at the Mexican line, 1405-ft level, is driving ahead in very promising vein matter.

**SUCCESS.**—Sinking the main shaft is making the usual good progress, everything working well. More streaks of quartz are coming in at the bottom, and the indications are more favorable as depth is attained.

**UTAH TAILINGS.**—The material in the face of the drift continues to drill and work badly, being soft porphyry, with streaks of clay and quartz, requiring close and constant timbering. No increase of water.

**NEW YORK.**—Very good progress continues to be made in sinking the main shaft below the 800-ft level. A slight increase of water is met with, but not enough to impede operations.

**UTAH.**—At the 1050-ft level both lateral drifts north and south are steadily progressing along the wall of the ledge, in favorable ground.

### BRISTOL DISTRICT.

**JACKRABBIT MINE.**—Pioche Record, Sept. 15: A large number of our citizens paid a visit to the Jackrabbit mine, in Bristol district, on Saturday and Sunday last. They all expressed themselves in one way, and that was to the effect that it is the "biggest" prospect they have ever seen for the amount of work done. Garrison & Emory were very obliging, and took the pains to show all visitors the extent of the ore in sight, and how they intended to mine it.

**PROSPECTIVE.**—The recent developments in the Jackrabbit and Mayflower mines have again started the prospecting element of Pioche out in search of new mines. Daily, for the past two weeks, a number of men, some of whom have left paying jobs, have started for Bristol and its vicinity, to see if they will not be lucky in striking something rich and paying, and we hope before long to see a considerable number of good strikes in that section. If several are made similar to the Jackrabbit and Mayflower our citizens will not care whether the Trustees of the Meadow Valley mine put in the pump or leave the mine as it is.

### ELY DISTRICT.

**RAYMOND & ELY.**—Pioche Record, Sept. 15: Things are going along as usual in this mine. Part of the week has been occupied in putting a fan on the lower level, interrupting work a few days. In the progress that has been made in the mine, the ledge looks as heretofore. The mill is running regularly, half on ore and half on tailings. The men discharged from the mine had been engaged for some time back in doing dead work, which was no profit to the company at present. It was too much expense to the mine to keep them at work running in that way, therefore they had to be discharged.

**MOVING.**—The work of moving the Floral mill to Condon canyon commenced on Monday, in the taking to pieces of the machinery. Only a light force of men are employed at present, but they will be increased as room is made for them. We understand the work of removal is to be completed in 30 days.

**PIOCHE BULLION.**—Wells, Fargo & Co. shipped during the week, bullion valued at \$4,508.

### ELLSWORTH DISTRICT.

**RECH MINES.**—Belmont Courier, Sept. 15: That Nye county possesses rich mines no one can deny. The ore shipped from Ellsworth district to the Sacramento reduction works, within the last few weeks, leaves no more room to doubt that if prospecting is thoroughly carried on, many such mines as the Downey and Illinois could be found. Judge Downey yesterday received a letter from Sacramento, informing him that the ore from his mine had been assayed, and averaged \$225 per ton in silver. Fifteen tons of high-grade ore are now on the way to the works. Work is also progressing finely in the Illinois mine. The ledge varies from five to seven feet in width and carries rich carbonate ore. The shaft is now down 240 feet.

### EUREKA DISTRICT.

**MINERS AT WORK.**—Eureka Sentinel, Sept. 15: The Eureka Con. mine and furnaces employ about 300 men, whose daily wages aggregate the sum of \$1,200; the Richmond company, 150 men, \$900; the K. K. Con., 130 men, \$820; the Jackson, 20 men, \$104; the Connolly, 25 men, \$80; the Bald Eagle, 16 men, \$84; the Hamburg, 70 men, \$280; Matamoros, 30 men, \$120; Lemmon mill, 25 men, \$100, and the small outcrop mines in the neighborhood, 100 men, \$400. It will be seen by the above that there about 860 miners and furnacemen now at work in the district, the daily wages amounting to about \$3,500, or \$105,000 turned loose on the monthly pay days. Add to this the sums disbursed for coal and other supplies, and it will be seen that considerable coin finds its way into circulation in Eureka. It is probable that the men employed on the Eureka mine will be put upon the rolls, which will proportionately increase the grand total.

**BULLION TAX.**—The tax upon the net proceeds of bullion from the Eureka mines, for the quarter ending June 30th, was \$382.85. Of this amount the Eureka Con. paid over \$700 of the total tax collected. It is a rather insignificant showing, but the present quarter the bullion tax will run up into the thousands, and the production for the three months will be much greater than any former yield in the history of the district.

**AT THE RICHMOND.**—Operations at the Richmond reduction works are being carried on at a lively rate. The two furnaces are steady at work reducing ore, and the quartz discharged from the mill turned out exceeds all anticipations of the managers. The refinery will start up to-day, and shipments of lead and silver follow shortly. Three ore trains, of 10 cars each, an aggregate of 150 tons, arrive from the mine daily, and the quantity will be increased as it is needed. There is a report that two more furnaces employed on the reduction of ore from the Eureka mine and tailings outside ore is being smelted. The Bald Eagle sends in a daily shipment of 10 tons, and other lots from Pros-

(Continued on page 188.)



### Bedrock Flumes.

#### A Chance for Cutting a Profitable One in Idaho.

We take the following from the *Idaho World*, published in Idaho City: Several years ago the question of practicability of constructing a bed-rock flume in Moore creek was considered in a business light, and a survey made to ascertain the amount of fall to the creek, commencing at a point about six miles below Idaho City, and running to a point about two miles above town. The grade was ascertained to be light, but sufficient to run with a large body of water successfully. Our delegate in Congress, Hon. S. A. Merritt, was requested to procure the passage of a bill through Congress, granting a right of way and privilege of using timber, stone, etc., in constructing the work. For some reason or other unknown to us now, the right of way was not granted; and not long after, some of the leading spirits in the enterprise left the Territory, transferring their means to other fields, and directing their business talents and energies in other channels. So the enterprise slumbered, and the

#### Vast Amount of Wealth

In gold and silver that ought to be taken out, still lies at rest in the bed of the creek. There is an extent of six miles in Moore creek and one mile in Elk, from its junction with Moore, that may be treated as ground that can be profitably worked through a bedrock flume on a large scale. These seven miles will average more than 600 feet in width and 12 feet in depth of tailings; top dirt that was stripped off of bottom gravel in early days, and occasionally new ground. The lowest possible estimate of the amount of gold contained in this seven miles of creek will exceed

#### Eleven Million Dollars,

Besides what is contained in the thousands of acres of low bars and flats that skirt the creek, and cannot now be worked for want of fall or dump. In addition to this amount of gold, it is estimated safely that

#### One Hundred Tons of Quicksilver

Lie so intermixed with the tailings that a company working the creek would have the advantage of at least a hundred thousand dollars worth of this article so indispensable in the working of mines.

These estimates are made so low that there can be no possibility of results falling below estimates; while the probabilities are in favor of obtaining double the amount of gold stated in the estimate. We ask for a thorough investigation of this matter by those interested in the prosperity of the country, and if any one can show the estimates to be unreliable or overdrawn we will be pleased to have them do it.

Besides the bullion obtained directly from the working of the creek bed, the advantages resulting from it indirectly as an artery of drainage, and as affording dump and outlet, are incalculable; and such a work would yield an annual revenue to the owners as a receptacle for tailings and second washings, after the creek bed shall have been worked out, as long as there is gold in the hills that rise from the creek.

After the expiration of Merritt's term in Congress a bill was drawn up and placed in the hands of Hon. John Hailey, who was then the delegate, but for some reason he failed to procure its passage. The bill provided for a right of way up the creek, together with the privilege of using timber, etc., in constructing the flume.

The franchise asked for could not deprive any one of their rights, neither could it have any other than a beneficial effect upon the interests of any. Without the flume they can never work a foot of their ground while time lasts, while for the privilege of dumping into the flume they could afford to pay a reasonable percentage of the gold yield and be greatly benefited in the end.

The company that was incorporated several years ago and made the survey of Moore creek, also embraced in their enterprise Graute creek and Grimes' creek, each of which are equally as rich, it is considered, as Moore creek; but it seems to us that the enterprise is too vast for one, and that three distinct companies would be more certain of success.

There is not sufficient local capital that can be enlisted in this enterprise to warrant the undertaking, but surely our citizens ought to be able to enlist foreign capital sufficient to carry the work into successful operation. When engaged in, it will pay a company largely, and afford profitable employment for at least 500 men for 12, 15 or 20 years.

A New York company has recently bought placer mines in Chile, and are preparing to work them by hydraulic process. They are to erect a 400-horse power engine to raise water from Catapilco lake to an elevation of 450 feet (into a reservoir), which is to be used in the pipes. The sluices are to be paved with railroad iron, and all the works are to be first-class and under the superintendence of an experienced California miner. The ground that all this capital is employed to work prospects 50 cents per ton.

There is no miner among us but who knows the ground we propose to work in Moore creek will pay more than 50 cents per ton, including that which lays on the bedrock. A great deal of top gravel was wheeled back in early days that would pay three and four "bits" to the wheelbarrow load. There are benches left here

and there along the bed of the creek that will pay that much to the pan of gravel; and yet we, for want of capital and enterprise, are allowing this grand field to lie unworked, while there are millions of dollars seeking investment, and some of it going to foreign countries to be engaged in less profitable enterprises.

After the first three miles are constructed, the work will be self-sustaining, and from the fourth mile will be dividend-paying; so that an outlay of \$90,000 would be in all probability ample to put in motion an enterprise of more importance to the country than the development of any half dozen quartz mines in it. This enterprise accomplished, will infuse new life into the country, increase its population and revive business. Real estate of all kinds, all over this county and Ada, would enhance in value on account of the increased business and increased demand for farm products. It is an enterprise that the business men and agriculturists of the country are more deeply interested in than even the miners themselves. Shall the matter continue to slumber, or will a few men most interested and most able put their shoulders to the wheel. With four miles of flume laid in either one of these creeks—Moore, Grimes or Granite—three years would not elapse without the other two being in operation also, the beneficial results of which would be great and permanent.

### Timber for the Mines.

#### Where the Lumber for the Comstock Mining Operations Comes From.

The distance from Carson City to Glenbrook, by way of the Clear Creek pass over the eastern summit of the Sierra, is 14 miles; to the summit of the pass but nine miles. A few years ago this range of mountains, from base to summit, was covered with a dense growth of pines. Much of this timber, it was believed, would never be available for commercial purposes on account of its seemingly inaccessible location. The great demand of the mines for wood and timber supplies soon, however, swept away the most accessible portions, and set at work the ingenuity of man to devise ways and means for getting at the rest. H. M. Yerrington, of the firm of Yerrington, Bliss & Co., and present Superintendent of the Virginia and Truckee railroad, was the first to solve the problem.

#### The Big Flume.

This he did by building a large V-shaped flume from the summit to the valley, which was double-boarded inside with three-inch plank, and large enough to float a 16 or 20-inch timber with ease. This flume is 14 miles in length and was carried down over rocky, rugged portions of the mountain, perfectly inaccessible to any other method of conveyance. Nothing of the kind had ever before succeeded in this section of the country, as it was not only necessary to crook and curve the flume badly in many places, but to give it in others a fearful pitch or fall, which was likely to make it choke, run over, and cause the loss of much lumber and wood. In order to prevent this, men were stationed at the most dangerous places, and provided with an instrument for lifting and handling the timbers so perfect in its strength and shape that a single man perfected in its use could lift the largest log or piece of timber when in motion from the flume and land it safely on the ground. On the summit this flume has been gradually extended, both north and south, until the beautiful pine forests that covered the mountain peaks have melted away, and nothing is now left to bless the gaze of the eye save the bright blue skies and heaps of naked granite boulders. This flume, at a day's run, has often delivered from the summit to Carson City 500,000 feet of lumber and 750 cords of wood. The summit of the mountains once swept, the longing eyes of the capitalist were soon turned to the grand old forests that hung in dense profusion on the borders of Lake Tahoe. But how were they to make them available?

#### The Narrow-Gauge Railroad.

The eastern summit was 1,500 feet above the level of the lake, and to reach the flat border next the water, it was necessary to descend a steep and rugged mountain side 1,000 feet almost perpendicularly. But the avarice of man, when stirred up by visions of wealth almost within its grasp, pauses at no barrier, and in a short space of time it was announced that Yerrington, Bliss & Co. were building a narrow-gauge railroad from the margin of the lake to the summit. A few days since a representative of the *News*, leaving the stage at Summit station, accepted an invitation of John A. Johnson, the efficient and courteous superintendent of the road, to enjoy the pleasures of a ride over the road from the summit to Glenbrook. The road is nine and a half miles in length, the steepest part of the abrupt portion of the grade being 165 feet and the least 120 feet to the mile. Seated on the pilot or cowcatcher of the engine, we had but fairly started before we entered a tunnel hewn through solid rock a distance of 500 feet. Emerging from that, we glided swiftly down the mountain side, dodging quickly and cautiously in our tortuous course around the huge cliffs and piles of granite that blocked our way, until, reaching a craggy point of granite along which the road ran, the lake like a grand and beautiful vision opened to our view. So delightful and absorbing was the beautiful landscape upon which our eyes rested, that we noted not the route over which we were

borne so swiftly, until, casting our eyes downward, we found ourselves on a rocky promontory at the almost extreme end of the road. But a few feet more would have reached the end and hurled us over a huge precipice, hundreds of feet, into the lashing waves of the blue lake below. Just as it seemed as if nothing could save us, and the trestle-work on which the road rested appeared to be giving away beneath us, the locomotive whistle gave a wild shriek, the engine was reversed, a switch was opened at the back end of the train, and we glided gently backward down the mountain slope for a quarter of a mile; then another switch was opened and we dashed ahead for about the same distance; then again reversed and backed down, and so continued to do, the track of the road describing the exact figure of the letter M, until the more favorable ground of the margin of the lake was reached, a thousand feet directly below the point from which we started. The engines used on the road were manufactured to order and are models of beauty and strength. A single engine hauls up the steep grades, with apparent ease, a train of six or eight cars heavily loaded with lumber or wood, which, on reaching the Summit, are dumped into the flume and sent on their way to Carson City.

#### The Mills.

On the margin of the lake at Glenbrook the company have erected two model saw-mills, complete in every modern device and improvement for cutting logs brought from the opposite side of the lake into lumber and timber ready for shipment. For a time attempts were made to gather in the beautiful pines of Lake valley, at the head of the lake, but the heavy quicksands stretching back for a long distance prevented a successful accomplishment of the work. To overcome this, probably, the first engine and railroad in the United States for logging purposes was built. When the order was given for the building of this engine, and a statement of its intended use made to the manufacturers, they could hardly be convinced that a locomotive and railroad could be used for such purposes. The judgment of the managers, however, proved correct, and the enterprise is now one of the most successful possible. The road track is made portable, so that as fast as one swath of the great pines is swept away the road is moved over and another is commenced.

#### The Meteor.

For a time the company experienced much trouble in getting booms of logs conveyed from the opposite shores of the lake to Glenbrook quick enough. Sudden changes of weather are liable to occur, and strong gusts and whirls of wind arise suddenly on the lake, which are liable to wreck and scatter a boom of logs while under transit. To overcome this trouble the company had manufactured in the East, at a cost of \$30,000, one of the most substantial and swift little iron steamers ever set afloat. Light of draft, and gliding through the water at the rate of 22 miles an hour, it is more like a thing of life than a combination of mechanical skill, and bears the name of *Meteor* on her prow with an appropriateness seldom equaled. On every side of the lake the mountain gorges are being swept by this company of their wealth and beauty. Already huge barges are floating wood, a thousand cords at a trip, to the terminus of the narrow gauge at Glenbrook, from whence it is shipped to Virginia and Gold Hill to supply our mills and mines.

The energy, enterprise and courage displayed by Yerrington, Bliss & Co., in the successful building and operation of these flumes, railroad, mills and steamers, is almost wonderful, and furnishes an example of determination and industry seldom if ever equaled.—*Gold Hill News*.

### A New Tunnel Project.

The *Salt Lake Tribune* says: For some time past, George A. Jackson, a well-known mining superintendent of Bingham, has been watching the course of all the main producing veins in West Mountain district, and has concluded that they all sprang from one center—the great Bald mountain of the Quirrh range. From this mountain runs a spur in a northeasterly direction, Butterfield canyon being on the south side and Bingham canyon on the north. It is into this spur, near the junction of the main range, that all the veins point. Another feature is that the nearer you approach the main range, the higher grade the ore becomes in silver, and, in some cases, fine chutes of gold-bearing quartz have been found, assaying up in the thousands. This is the situation as found by Mr. Jackson, who concluded to at once locate a tunnel cutting the ledges of ore at right angles, commencing in Butterfield canyon, running in a northwesterly direction into Carr Fork canyon. This will certainly cross-cut every ledge known in Bingham canyon, and many fine veins not heretofore discovered. It is certainly destined to be one of the largest and richest mining enterprises of Utah. Work has already commenced on the tunnel, and Mr. Jackson, as manager, proposes to push it as fast as he can by hand, and as soon as machinery, such as compressors and power drills, can be got, will drive it at the rate of 50 feet per week. The chances are that before 1,000 feet have been driven the tunnel will be in pay ore and become remunerative to the owners.

Mr. Jackson is now incorporating the claim, and parties in California have also examined the claim and propose joining him.

### Gravel Mining in Tuolumne County.

There is little doubt that Tuolumne county contains a number of gravel beds that are destined to be made profitable when worked in a proper manner. For some reason there is not to this time a single gravel claim worked as it should be, to get profit where gold is sparsely scattered. There are many things connected with the working of gravel, on a large scale, that has been neglected entirely by our miners; but the time is at hand when there is every reason for believing that in this class of mining our county will not remain behind those northern counties, that have poured out so much treasure from gravel banks. When water comes, several claims in different portions of the county will be put in active operation, which, with proper appliances, cannot fail to pay handsomely. The gravel here prospects equally with that of other places, where this kind of mining has been very successful. The old way of working must give way to a system that reduces the banks many times faster. Our townsman, Caleb Dorsey, Esq., who has prospected in the gravel range beyond Garrote, is preparing to work on the largest scale this winter; he is making new and repairing old ditches, putting in tail races to empty into the Tuolumne river, building extensive flumes, getting new pipes and all of the most approved appliances known. He expects to have every thing ready by the first of November, and expects the outlay to be from \$25,000 to \$30,000. He will have a pressure of 200 feet, with a bank of gravel ranging from 75 to 200 feet in depth, that prospects, as we are informed, equal to those claims that have become famous in the northern mines of this State. Last winter, with 84 feet as the highest pressure, but only an average of 60 feet, in prospecting, one run of 25 days cleaned up \$1,400; another run of 15 days yielded \$1,354. With the pressure now gained, Mr. Dorsey says that a pipe will do more than three times the work that could be done when prospecting in the winter. The claim is superintended by A. Catlin Cook, a practical man in every sense, who has had large experience in this class of mining for a number of years. He was formerly and for a long period a resident of this county, connected with water ditches and flumes. We have known him long and have implicit confidence in his judgment. He says there is no reason why this gravel bed should not pay largely; he expresses satisfaction with the prospects, and entertains no doubt of making the claim a very profitable one.

There can be no question that the old county will yet create a sensation when her gravel beds are properly opened, and our miners cannot do better than turn their attention in this direction. Soon as one claim is successfully worked it will be followed by many, many more.—*Union Democrat*.

**THE MCCrackIN COUNTRY.**—We learn from Mr. George R. Ammond, manager for Allen & White, the contractors for constructing the new 20-stamp mill on the Sandy, three miles south of Greenwood, that the machinery for the mill is now at Aubrey, and will soon be landed on the site where it is to be erected. Mr. Ammond contracted some time since, with Mr. George W. Curtis, of this town, for the lumber, some 150,000 feet, and is now here for the purpose of contracting for freighting the same to Greenwood. Owing to the continued dry weather no grass has grown in that section this season, consequently work cattle and mules have to be fed entirely on tame hay, grown on ranches in that vicinity. A new road is now being opened from the sink of Date creek, nine miles below Gilson's ranch, by one of our most enterprising freighters, Mr. J. M. Bryan, who is taking in barley from Salt river to Greenwood for the use of his teams, which are employed hauling ore to the Greenwood mill for the McCrackin company. The road when completed will be free from rock, of easy grade, and water and grass plenty, therefore we apprehend that Mr. Ammond will have but little trouble in finding freighters. The Signal mill, owned by Leet, Ewing & Co., is nearly finished, and will soon be doing its work on ore from an extension claim of the celebrated McCrackin lead. The old Greenwood is still pounding away, and the yield is about \$40,000 per month, with thousands of tons of rich ore in sight, and the general outlook in the Sandy country never was better than at present.—*Arizona Miner*.

**MINERAL HILL.**—The lowest workings at Mineral Hill have only as yet attained a depth of 180 feet, and the enormous returns in former years from that locality all came from surface deposits. All the miners who reside and work in that locality are firm in the belief of the existence of a ledge at a greater depth, and have the utmost faith that future operations will prove the correctness of the theory. Its probable pitch is gravely discussed, and heated arguments often ensue as to whether it dips to the east, or will turn to a westerly inclination as the vein is explored. If Captain Plummer receives the necessary instructions, and he is daily expecting them, the diamond drills will soon be set to work, and the question settled beyond any further dispute. If the miners' theories are correct, the little town on the hill has a lively future before it.—*Eureka Sentinel*.

**NOTE ON THE STRIKE.**—Of the 104 locomotives burned in the roundhouse of the Pennsylvania railroad, at Pittsburgh, 50 have been pronounced worthless except for scrap. The remainder will be sent to Altoona for repairs.



## Wild Rose District.

A correspondent of the *Coso Mining News*, writing from Wild Rose, Inyo county, says:

"Having looked in vain over the columns of the *News* for some news or information regarding Wild Rose, that youthful bud of the Panamint range of mountains, and having despaired of ever receiving the much-desired information, I concluded, in that event, that as Wild Rose undoubtedly would not come to me, I would necessarily have to go to Wild Rose, and here I have been ever since. And it seems the longer a fellow tarries here the better he likes Wild Rose. But really, to be candid, it is not surprising that such should be the case, when we take into consideration its beautiful and picturesque location and its surroundings; situated as it is, in a beautiful and luxuriant valley on the Panamint range of mountains, 28 miles distant, almost in a due line east from Lookout, and connected therewith by a well graded and appointed road in every particular; and from Panamint, in a bee line, about 12 or 14 miles, and lying at an elevation of 10,000 feet above the sea level. The climate is unexceptionable; in the day time the thermometer ranges from 60 to 70 degrees. The nights are very cool, so much so that you can sleep delightfully wrapped up in two or more of the heaviest double blankets. It is a matter of much surprise to me that this delightful little country valley is not overrun with tourists and pleasure-seekers during the heated season, and thus avoid the sweltering and debilitating weather so common outside of this favored Eden. The hills and canyons here are thickly wooded with beautiful trees of that class of wood commonly known as nut-pine, cedar and juniper. The latter tree is very luxuriant in its growth, and serves as a very beautiful shade tree. Game is plentiful, but of the smaller class, embracing the jack rabbit, quail, doves, etc., and, I may mention, an over-abundance of coyotes and the wily fox, which fact necessitates rather elevated roosts in the poultry yards, of which there are not a few.

The founder of this romantic little town was James Honan. When Panamint died that natural death that I fear has no waking, Honan, Arab-like, folded his tent and silently glided over the mountains and in here. He subsequently entered into a contract with the Modoc company to furnish them with all the wood they required for a definite time for the smelting of their ores. However, the greatest difficulty that he and this camp had to overcome was how to obtain a good supply of fresh water. But this barrier was soon overcome by the pluck and indomitable perseverance of Honan, combined with that all-powerful lever, "the almighty dollar." So that we can boast of as good a supply of as pure fresh water as there is in the country.

The hills and mountains hereabouts are, beyond question, rich in the precious metals, particularly in that of silver, although I have been shown rock taken from ledges here rather richly impregnated with gold, leading me to believe that the time is not far distant when there will be developments made here in the line of mines and mining that will cast into the shade any and all similar efforts made within this country.

August Hoeltze, a Prussian by birth and an experienced and practical miner, who arrived here from Arizona but recently, which latter place he has been a resident of for years, prospecting and mining alternately, is now occupied in working a ledge that he recently discovered, about two miles from here. He is in company with a party by the name of McDonald, also a miner of no mean caliber. I have been shown some of the rock that they have taken out of the tunnel and shaft, which are only in about 20 feet as yet, and I have no hesitation in stating that it looks well, if not actually rich, and, I suppose, would assay at least \$500 per ton.

Mr. C. Wiser, a noted expert on anything and everything relative to mines and mining, has been spending the summer here for the benefit of his health, at the earnest advice of his physician. He has devoted a considerable portion of his spare hours, and when his health would admit, to prospecting after the hidden treasure; it is almost superfluous for me to add, with marked success, if not wonderful. He informs me that he has located and recorded no less than 23 well defined silver-bearing ledges, some of which, he assures me, are unsurpassed in richness. It is his intention, as soon as his health will permit, to commence the working of one or all of them.

**CLAIM FOR SMELTING ORE.**—M. Seligman has filed a complaint in the Fourth District Court against the Coso Consolidated mining company to recover \$6,430. It is alleged that within the past two years the Cuervo mining company has been a legal corporation. At the request of the defendant the Cuervo company smelted and converted into bullion 479 tons of lead and silver ore, under an agreement by which the latter was to be paid \$23 for each ton of ore smelted; payment to be made at the completion of 100 tons. The 469 tons were smelted by March, 1876, and the defendant became indebted \$11,030 to the Cuervo company. Of that amount only \$4,600 has been paid. Before the commencement of the suit the Cuervo company sold and assigned the balance of the indebtedness to the plaintiff, who now brings action to recover.

## USEFUL INFORMATION.

## Making a Well.

There are some who find it convenient to make a well in the old way, although the boring and piping apparatus is of more general use. To such a hint from an article written for *Scribner's Monthly*, by Mr. S. W. Pinkham, will be of assistance to preserve the water from insipid drainage or surface flow: "First, of course, the well must be so constructed that it cannot act as a drain for the neighboring soil. This can be done by making the wall above low-water mark of some material impervious to water, or by omitting this part of the wall altogether. The first can be accomplished by having the wall from a point two or three feet from the bottom made of brick with a coating of hydraulic cement on its exterior, or of hydraulic well-tubing with the joinings well protected with cement; in either case the earth should be thoroughly packed around the wall, and a slight embankment should be made around the orifice to prevent the in-flow of surface or storm water.

"In such a well the draining surface is so reduced, and placed at such a distance below the surface of the ground, that in the great majority of instances the introduction of foreign matter becomes impossible, except in so far as there is a chance that substances will fall into the well from above. To prevent this the well should be kept covered when not in use. In most cases, however, it is better to omit the upper part of the wall altogether. After the excavation is completed, the wall can be built in the usual manner for a distance of two or three feet, more or less, as circumstances may demand; the service pipe can then be placed in position, and the wall arched over. The remainder of the excavation can then be filled with earth, well packed as it is thrown in, and the pipe carried to any convenient point. It will be necessary to place above the arch several layers of stones successively smaller to prevent the falling of the earth into the space below.

"The workmen will probably suggest a layer of turf or straw to accomplish this object, but the presence of either of these substances will cause the water to be unpleasant for a considerable time, and will prove the cause of much annoyance.

"There is a prevalent notion that a well should be ventilated for the purpose of allowing noxious gases to escape, and that water is better for being exposed to the air. I hardly need state that the only noxious gases in a well (i. e., gases which render the water unwholesome) are the products of the decomposition of organic matter which has found its way into the well in ways which have been described above, and that water, as it flows in its subterranean passages is more perfectly aerated than it can be in any other way."

## Postal Law Shams.

A writer in the "Contributors' Club" of the *Atlantic Monthly*, for September, exposes what he calls the sham of postal laws, which discriminate between authors' manuscripts intended for publication in book form and those offered as contributions to newspapers and periodicals, illustrating the result as follows: "We authors write about 25 magazine articles each a year. Postage (letter rates) average 40 cents on each article—ten dollars a year for each of us. There are \$48 authors in the country who write for magazines. Most of our articles are not accepted, but are returned to us. We pay postage just the same, though, both ways. Considering, for the sake of argument, that we use the mail and not the express, our postage on matter sent aggregates \$8,480 a year; return postage on upwards of two-thirds of our work hurled back upon our hands, say \$6,000. Aggregate for the year, \$17,480. Aggregate for three years, say, in round numbers, \$43,500. Among us, in this country, there are 441 who write books as well as magazine articles. But we do not write a book every year; we average a book each every three years. That is an aggregate of 441 books in three years. Postage on each book (as authors' manuscript), an average of 20 cents. Now observe: Aggregate postage (letter rates) on three years' magazine manuscripts \$43,500; aggregate postage on three years' book manuscripts (authors' manuscript rates), \$88.20."

**KILLING ANTS.**—Fruit growers, gardeners, and, in short, men of every business, in some parts of this State, who have land enough for an ant-hill, are grievously afflicted with these pests. A Texas correspondent of the *Journal of Chemistry* relates his experience and treatment as follows: "We find flooding with water the most effectual means of destroying them, and too often the most impracticable, for two reasons: First, because these creatures with the spent leaves and earth hank up their holes so as to ward off the water (if there should be a knoll in the field it is sure to be an ant-town); secondly, because of the scarcity of water. We cut deep channels towards the ant-towns, so that when the rain comes it may run along these ruts and flood the ants, but it is frequently a laborious and often an impossible method. Our nurseries contain some 60 acres, and on this space alone we annually use \$100 worth of cyanide of potassium as ant poison. We dissolve three or four lumps about the size

of marbles in a gallon of water, and every morning and evening pour three tablespoonfuls of this mixture into the various working holes. The fumes kill all the ants that cross it for an hour or two; still it only keeps down their numbers, and never completely eradicates them." Any of our readers who wish to try the Texas remedy must remember that cyanide of potassium is one of the most virulent poisons, and should be most carefully handled and used.

**TANNING A LAMB SKIN WITH THE WOOL ON IT.**—Make a strong soapuds, using hot water; when it is cold wash the skin in it, carefully squeezing it between the hands to get the dirt out of the wool; then wash the soap out with clean, cold water; next dissolve alum and salt, of each half a pound, in a little hot water, which put into a tub of cold water sufficient to cover the skin, and let it soak in it over night, or 12 hours; now hang the skin over a pole to drain; when well drained spread or stretch carefully on a board to dry. It need not be tacked down if drawn out several times with the hand while drying. When yet a little damp, sprinkle pulverized saltpeter and alum (an ounce each mixed together) on the flesh side, rubbing it in well. It is now to hang in the shade two or three days, the flesh side in, until perfectly dry. When entirely dry, scrape the flesh side with a blunt knife to remove any scraps of flesh. Trim off all projecting points, and rub the flesh side with pumice or rotten stone, and with the hands. Prepared in this way, it is white and beautiful, suitable for a door mat, and also nice for the feet in a sleigh or wagon in cold weather.

**BURNING GARBAGE.**—The process of cremation, says the *American Architect*, suggests a means to solve the serious question, what shall be done with the street refuse and garbage. An analysis of collections from 13 representative districts give the following average results: Water, 3.032%; nitrogen, 0.369%; combustible material, 28.454%; incombustible material, 68.514%. Prof. Chandler, President of the Board of Health, suggests a system of garbage cremation in furnaces similar to those in the manufacture of shell-lime. It is said that 200 tons of refuse and garbage can be cremated and rendered innocuous in 24 hours. Such a system would involve less cost than conveying it to deep water, and be far more consistent with the demands of civilization and public safety.

## GOOD HEALTH.

## Rendering Salt Meat More Nutritious.

Professor Robert Galloway has published a second edition of his pamphlet on a method for rendering salt meats more nutritious and thereby preventing scurvy. This, says *Public Health*, he believes, is to be accomplished in a simple and natural manner. He points out that certain substances go to form or constitute flesh; during the operation of salting the flesh some of these substances are removed and carried away in the brine, the chief constituent thus removed being phosphate of potash. It is evident that if this salt was necessary for the formation of the flesh in the first instance, its absence from it when salted cannot but be injurious. Professor Galloway therefore recommends that it should be used with salt meat either at or before the time of eating. He claims for his idea an analogy with the plan adopted by human beings in every quarter of the globe of eating common salt (chloride of sodium) with fresh food to make up the deficiency of soda salts required for the proper formation of the blood. Salted meat, argues Professor Galloway, is deficient in potash salts, and certain potash salts are required for the formation of the juice of the flesh; consequently phosphate of potash ought to be employed with salted meat as common salt is with fresh meat. The importance of phosphate of potash for nutrition, and indeed for vitality, has been proved by Pasteur and Mayer. In their investigations on the physiological study of fermentation, and the development of cellular organisms, they have shown that this salt is absolutely necessary, even for the development and nutrition of the yeast cell. This being so, what can be the effect of food deficient in phosphate of potash on man but malnutrition, or, in another word, disease? Some objectors have urged against Professor Galloway's plan that although true in theory, it would not succeed in practice, because the phosphate of potash would not be assimilated. His reply—and a very sensible one—is, it is sufficient to know that common salt is assimilated to believe that a like result would attend the use of phosphate of potash. Other objectors who have objected to his theory have declared that it is the citric acid in potash which prevents ordinary food from producing scurvy. Professor Galloway's answer is that the blood and juice of the flesh can no more be formed out of food deficient in one or more of the necessary constituents for their formation than bone can be formed without phosphate of lime. The beneficial effects of lime juice in the prevention of scurvy are, Professor Galloway thinks, due to the presence of the potash and phosphate it contains; but he admits that this view was doubted by the late Dr. Parkes. It is certain, however, that neither Dr. Parkes nor any other medical man has yet explained the beneficial action of lime juice, and it is equally certain that its administration is distasteful to many sailors. It certainly would

be much the more rational and pleasant plan to take phosphate of potash with the food than to take, some hours before or after, a dose of medicine having for its purpose the same object.

**THE WRITER'S CRAMP.**—A paper read by M. Bonilland before a recent meeting of the French Academy of Sciences gives an account of his further researches relative to lesions of the brain. In his former communications he demonstrated that the loss of speech was due to a malady of the third convolution of the left anterior lobe of that organ. He now goes further, and asserts that the three faculties which essentially distinguish man from other animals—speech, reading and writing—are each controlled by separate portions of the brain. In his researches he discovered that the paralysis of one of those functions could exist without the others being affected, and he gives as an example a case in which he was called to a consultation on a young man whose avocation compelled him to write continually. At first the patient had felt a slight weakness in writing, then a great difficulty; and finally, an absolute loss of the faculty. The result of the closest examination could not detect any defect in the muscles of the arm or hand, the latter retaining all its sensitiveness and power for every other purpose than that of writing, and all his other functions being normal and in good condition. The conclusion arrived at was that the source of the infirmity must not be sought for in the external organs, but in the center itself of nervous action—the brain. The young man was advised to learn to write with the left hand, which he rapidly succeeded in doing. The defect from which he suffered had long been known as writer's cramp, just as the loss of speech was for centuries termed paralysis of the tongue. Both designations were equally erroneous, both being now attributed to maladies of certain portions of the brain.

**HEAD TO FOOT WASHING.**—At the recent Domestic Economy Congress, held at Birmingham, Mr. Edwin Chadwick, C. B., said the effect of cleanliness was not sufficiently recognized. He found evidences of its effects in various ways. Dealing with the animal creation, he said the pig that was washed would put on one-fifth more flesh with the same amount of food than the pig that was unwashed. The same effect was observable in other animals. They had seen the horse washed from head to foot to give it additional force. The same argument applied to the human creature. He knew the case of an army hemmed in by the enemy and put upon half rations. They were regularly washed, and it was found after a time that the men who washed were equal in force to those who were unwashed and put upon full rations. Head to foot washing was not only important in the matter of economy in food, but also for the prevention of contagious disease. Nurses who attended scarlatina cases and other cases of contagious disease had found out that, by washing twice a day, and sometimes by changing their clothes, they might withstand the dangers resulting from the practice, and doctors who were similarly engaged had come to the same conclusion. As a defense against an outbreak of epidemic disease he would have the whole population washed. He mentioned that in a prison containing 1,200 persons washing was enforced, and instead of using 70 to 80 gallons of water for each bath, and causing a large expenditure of time, a very simple method was devised for giving the prisoners a thorough good bath. Each man was placed in a recess, with a spray of tepid water overhead, which completely cleansed him. Schools at which unwashed children attended were centers of children's epidemics.

**THE USES OF THE LEMON.**—As a writer in the *London Lancet* remarks, few people know the value of lemon juice. A piece of lemon bound upon a corn will cure it in a few days; it should be renewed night and morning. A free use of lemon juice and sugar will always relieve a cough. Most people feel poorly in the spring; but if they would eat a lemon before breakfast every day for a week,—with or without sugar, as they like—they would find it better than any medicine. Lemon juice used according to this recipe will sometimes cure consumption: Put a dozen lemons into cold water and slowly bring to a boil; boil slowly until the lemons are soft, but not too soft, then squeeze until all the juice is extracted; add sugar to your taste, and drink. In this way use one dozen lemons a day. If they cause pain, or loosen the bowels too much, lessen the quantity and use only five or six a day until you are better, and then begin again with a dozen a day. After using five or six dozen, the patient will begin to gain flesh and enjoy food. Hold on to the lemons, and still use them very freely several weeks more.

**WHOOPIING COUGH.**—It is some years since Letzerich affirmed that whooping cough was due to a special fungus. The assertion has been lately confirmed by the researches of Tschamhor. In the spittle of children who are suffering from the cough, there are little corpuscles, about the size of a pin's head, of a white or yellowish color, which pass through a series of characteristic changes, and which seem to be identical with fungi which are found on the peel of oranges, apples and some other fruits. By inoculating rabbits with these fruit fungi, and by causing men to inhale them, Tschamhor produced convulsive coughs of many days' duration, with all the characteristics of whooping cough.





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SAN FRANCISCO:

Saturday Morning, Sept. 22, 1877.

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To Watch Speculators, J. Bride & Co., Clinton Place and No. 11 Eighth Street, N. Y.; Terrill's Underground Meter, 89 Dey Street, N. Y.; Miners, Attention! Richard Hoskin, Dutch Flat, Cal.; Assessment Notices—Mariposa Land and Mining Co.; Fresno Quicksilver Mining Co.; Delinquent Sale—Dolores Consolidated Mining Co.

## The Week.

The week has been characterized more by a spell of exceedingly warm weather than by anything else. Of mining news there is nothing of startling import. The principal excitement in connection with mining matters was the difficulty between Ford, the deposed Secretary of the Ophir, and J. B. Weller, the President of the company. Ford assaulted Weller on the steps of the International Hotel. Col. Weller has a few welts across the face, but otherwise he was not hurt. The cause of the attack was the recent removal of Ford from the office of the Ophir, on a charge of embezzlement, and his subsequent arrest—all of which was brought about by Weller's investigation of the affairs of the mine. As far as the mining share market is concerned, there is very little doing, and fluctuations are slight. The State fair at Sacramento opened on Monday last and was continued through the week. The close of the week will also hurry the close of the Mechanics' fair, which has had a most successful season. We have given a pretty full report of everything of interest in connection with this exhibition, which is one of great importance to the coast.

THE Elko Independent asserts that the terms of a compromise between the Comstock mine owners and the Suto Tunnel company has been agreed upon between all the parties interested, except one of the partners in the Bank of Nevada firm.

## A New Method of Coating Substances With Copper.

Mr. Kustel, the well-known metallurgist, has devised a new method of coppering cast and wrought iron, steel and brass without the aid of galvanic batteries. The usual way of coppering iron, without the aid of a galvanic battery, is, in respect to durability, very imperfect. Articles coppered in this way cannot be cleaned by rubbing, as the very thin coating would come off. The diluted solution of sulphate of copper (bluestone), with addition of sulphuric acid, does not permit the articles to be immersed longer than a few seconds, for the purpose of obtaining a thicker coating, otherwise the precipitated copper would not adhere. Other more proper methods to copper iron without batteries are not only too expensive, but hardly practicable on common ware like nails, tacks, spikes and the like, of which a great mass at a time could be coppered. Especially in this respect, and in regard to durable coating, Kustel's new method seems to be the only one that answers the purpose for the finest article as well as for the roughest.

Kustel's copper bath is easily prepared and not expensive. It consists of hyposulphide of copper-soda (2 NaO, 3 Cu<sub>2</sub>O, 5 S<sub>2</sub>O<sub>3</sub>, 5 HO), and is obtained by mixing a concentrated solution of bluestone with a concentrated solution hyposulphide of soda, both salts easily dissolved in water. It can be prepared, also, in the following way: In a hot solution of one pound of bluestone, a little less than two pounds of hyposulphide of soda salt is introduced and kept in motion by stirring with a wooden stirrer. If the yellow precipitate should get too thick, some warm water may be added. After all the salt is dissolved, and the clear fluid above the yellow precipitate appears green, some more hyposulphide of soda may be added, only so much that, when dissolved, the fluid should still show a yellow-greenish color. Too much of hyposulphide of soda would again dissolve the yellow precipitate.

The yellow mass is put into a filter of cloth or thin canvas, and, after the greenish water runs off, washed by pouring clean water into the filter, till it runs off nearly colorless.

The iron articles, whatever they may be, even large statues, after being perfectly freed from the oxidized surface, in the usual way, by diluted sulphuric acid, are washed in fresh water, and, if perfectly clear, introduced into wooden vessels conforming to the shape of the iron articles, or, if a great many small objects have to be coppered, in a revolving barrel, and so much of the yellow precipitate added as to cover the articles. A slow revolving of the barrel, or turning of the article, is necessary in order to change the touching points, and to get a uniform coating. After five or ten minutes the articles are examined, and, if a thicker coating is needed, the process may be continued a little longer. When ready, the articles are taken out, washed several times in hot water, and quickly dried, etc.

As long as there is any of the yellow precipitate in the vessel, another set of articles may be charged, and, if the operation goes too slow, some more of the precipitate is added.

The coppered articles must show a bright copper color, which is sometimes increased by a small addition of carbonate of soda or a piece of cyanide of potassium. This process, being new, leaves space for improvement, which may be suggested only by longer manipulation. The copper adheres to the article, so that it might be polished with steel. A nail, after being in the bath for 15 minutes, can be driven through a two-inch plank without the least injury to the coating. The yellow precipitate, if dried, can be used advantageously as a coppering powder on finished articles like blades, etc., rubbing it wet with a piece of cloth. This improvement is a highly important one, from a scientific and industrial point of view. In the construction of vessels, boats, etc., all the iron work might now be coppered at less expense than galvanizing, and to much more advantage. In fact, coppered metal can be used for a variety of purposes where bare iron or steel does not stand well.

**CLAY-STREET HILL RAILROAD EXTENSION.**—The owners of the Clay-Street Hill wire cable road have a large force of mechanics and laborers employed in extending that road from Leavenworth street, the present terminus, to Van Ness avenue. The extension in distance is 2,000 feet, and the descent 200 feet. The cars will be running to Van Ness avenue early in November, but it will be necessary to suspend the running operations of the whole line for six or seven days prior to the completion of the extension. A. S. Hallidie, President of the company, reports that the speed of the cars will be increased ten per cent. after November 1st, and the number of cars and dummies also increased in a corresponding ratio. The additional power required will be supplied by two engines, each 36-inch stroke and 14-inch diameter of cylinder. The extension has been solidly built of the best materials of construction. Cast-iron supports joined together sustain the tube-rail and road bed. The total cost of the improvement will exceed \$70,000.

THE yellow fever has become epidemic at Fernandina, Florida.

## The Stereometer.

We were much interested in examining, this week, several appliances, designed by Mr. Chas. F. Butte-Caspari, C. E., late professor of mathematics and natural sciences at the University Mound College, for illustrating in a more complete and practical manner than by diagrams, various mathematical problems. One of these appliances, called the stereometer, is an entirely new thing, and one of great interest to teachers and students of mathematics. The stereometer consists of two frames, the upper one being a square, the sides of which are three feet long; and the longer one is formed by two such squares. Both frames are kept in position by four small columns, four feet in height, and standing on four legs, by which the whole is supported and fastened to a common table. In these squares graduated cross-bars (of any desired number) are fastened by screw-clamps. They move horizontally in two directions, parallel to the sides of the square, while similar bars, four feet long, are perpendicular to the frames and parallel to the columns. The cross-bars and framework are made in two pieces of one-half by one-eighth of an inch, leaving between them an open space of three-sixteenths of an inch, in which, again, a simple screw-clamp moves, holding a needle in position, perpendicular to the bars and frame. These needles are pieces of strong common wire, flattened a little on one end, with an oblong hole in the end. By this arrangement a mechanical way is found to determine the position of any point in space within the apparatus. The shifting of the cross-bars (say north or south), the moving of the clamp in the split of the cross-bars (east and west), and the moving up and down of the needle in the clamps, are true representations of the equations of a point in space. It is self-evident that the position of an unlimited number of points can be determined, and, consequently, any solid figure can be represented in contour lines by drawing wires—or, better still, elastic silk cords—through the corresponding points.

As long as straight-lined figures are required, these threads are an excellent means to represent the same; but all sorts of other solids, viz., cones, cylinders, spherical triangles, etc., can also be exhibited easily by using, in lieu of threads, strong brass wires bent to the curvature required.

Should it be desired to represent points and lines in the sphere, a skeleton wire globe of two feet in diameter is added to the apparatus, by which any problems arising in astronomy, geodesy, etc., may be easily shown by means of intersecting rings, kept in position by spring clamps, colored black and white as far as they represent given or required quantities.

We have seen several illustrations of mathematical problems on this apparatus, convincing us at once of its utility and importance. Within the space of the square a solid was constructed, representing the proposition that the frustum of any triangular pyramid is equal to three pyramids, having equal heights with the three bases: (1) lower base of the frustum, (2) upper base of the same, and (3) the mean proportion of both. The whole frustum and the four pyramids required appear in distinct shape, and exact, being so plain that the whole proposition is easily understood at once.

Another illustration represented conical sections and the relations of the hyperbola, showing axis major and the asymptotes. No other model can show these lines in their true positions, as they are lying in space and nowhere in contact with the cone itself.

The constructor of the stereometer claims that the adoption of light wire skeleton globes in place of the old solid globes will bring quite an alteration in the manner our nautical astronomy is at present handled; and we must say that we were rather surprised to find that the lunar distances, so very important and useful to nautical men, and hitherto considered so extremely difficult of solution, in his hands dwindled down to the most simple solution of a single spherical triangle. The common solid celestial globe has undoubtedly a great disadvantage—celestial bodies can never be produced in their true position. East and west changes with the concave in the convex form, and often confuses beginners. The skeleton globe gives both the concave and convex forms, and the position of points and lines is seen on both sides.

Another figure gave an illustration of the octahedron form of a crystal of sulphur. All the axes are seen, and the peculiar passing over from spherical to plane trigonometrical triangle calculation was clearly and comprehensively demonstrated. Here, again, no other kind of model could have given the same important result. While speculative geology and geognosy have been quite a fancy science of great interest, the most accurate scientific part of the same—crystallography—is very seldom made a special study. The stereometer will bring every beginner easily over the elements of this most important branch, and should be in the possession of every geologist.

The models scheduled by the stereometer are perfectly accurate and complete, representing not only the solids, but also all lines of construction, which very often lay in space far off from the solid itself. Thus, all questions arising

in spherical trigonometry, conic sections, astronomy, crystallography, etc., can be easily illustrated. The large skeleton models of the stereometer are minutely exact, and can be divided to any number of integral solids, each of them clear, precise and easily discernible.

Every teacher of mathematics, and every student of the science, has had more or less of the same difficulty in forming a clear perception of the true position of and relation of points, lines and planes in space, and very few have mastered this question. Solid models are insufficient; in many cases quite impracticable and very expensive. The simple contrivance described solves the problem better than previous appliances, and will be a great assistance in all schools where geometry is taught. Teachers or students can make any stereometrical construction in a few minutes. Dihedral or polyhedral angles are shown in their true position and size. Polyhedrons are represented on a very large scale, so that angles and lines can be actually measured, if such should be required for industrial purposes. To the lapidarian this instrument is of advantage, who has always had to apply great skill and long experience to find the most favorable form for large precious stones, which would lose considerable value by diminishing their size more than absolutely necessary. With very little trouble, the stereometer will exhibit a series of shapes, all lying within a fixed space, the magnified size of the crude gem, from which the most effective or most favorable shape can easily be selected.

This stereometer is the first, and, as far as we know, the only instrument constructed by which the construction of models of solids is possible. Its value is self-evident. For class-rooms of universities, or advanced schools, it would be extremely useful, as they can be made of a size sufficient to be distinctly seen by all in a large room.

## Sunlight Printing.

We noticed, the other day, receipt of a map of the Suto tunnel ground, etc., showing certain details, and have since received a more perfect one, in which is embraced considerable more information than the previous one. The map contains all data which may be in any manner interesting, such as the water flow in miners' inches, temperature of air in header, number of holes drilled, aggregate depth of holes drilled, pounds of giant powder used, number of car loads removed, drills sharpened, formation of rock, different sizes of header, the header timbered and not timbered, the monthly progress in feet, total length, depth of shafts, number of working rock drills, etc. All these figures are given for each separate month during which the tunnel has been in progress. The monthly progress is shown by white and blue spaces alternately, so that one can see at once the varying progress for different months connectively. The map gives in a small space all information of this kind about the tunnel. A small map in the corner of the main one gives also the situation of the tunnel with respect to the Comstock lode, depth of connecting shaft and plan of the town of Suto, etc.

This profile work is printed by a process new to this coast, and called sunlight printing. This method will multiply drawings, maps, etc., and is a useful one for civil engineers, draughtsmen, foundries, railroad companies, etc., as it is simple and inexpensive. Copies taken in the usual way, that occupy several days to finish, may be completed by this process in a few minutes. From an original drawing as many copies as are needed may be taken without destroying the original, which may be made on common drawing paper in common colors; the thinner the paper the more opaque the drawing and the quicker and finer the sunlight proofs. Messrs. Kirchhoff & Specht, who printed the map referred to, showed us some very fine copies direct from printed originals. The sunlight printing can be made on any kind of drawing, writing or book paper, or on wood, linen, iron, leather, etc. Any person may use the process who chooses. An apparatus may be purchased, with paper, from Kirchhoff & Specht, and copies of drawings, etc., made with slight expense or trouble. The apparatus costs from \$20 to \$75 according to size, and the paper 15 cents and over per sheet.

The time required to produce these sunlight copies is from five minutes to an hour and a half, according to the thickness of the paper, and the sunshine. The gentlemen named produce these prints, also, if parties desire copies without troubling themselves to make them. The common sunlight prints are white on a blue ground; but blue figures can be made on a white ground, or even black figures on a white ground; but the latter requires more expense.

Lieut. Wheeler, who was recently in the city, and saw the process alluded to, intends introducing it in his office in Washington. An exhibition of drawings made in this manner is made in the Mechanics' fair, near the art gallery.

THE Point Arena News says: Petroleum has been discovered in a number of places in this vicinity in digging wells, but the richest prospect we have seen was struck in Jas. Underhill's lot this week. In sinking his well down deeper, he was discommoded by a large quantity of crude petroleum seeping through the rock into the shaft.



## The Grand Prize Mine.

The annual meeting of the Grand Prize mining company was held on Tuesday, when the following Trustees were elected: G. W. Grayson (President), M. Herman, (Vice-President), Henry Williams, E. M. Hall, and M. J. McDonald; Superintendent, S. Linkton; Secretary, R. H. Brown; Treasurer, Bank of California. The report of the Secretary shows the gross yield of bullion has been \$546,585.93. After deducting the discount amounting to \$55,460.51, and the express charge of \$6,263, it leaves a net balance of \$484,862.42. Of this amount the sum of \$222,502 has been expended for the erection of two mills, the hoisting works and supplies on hand at the mine and mill. There has also been paid the sum of \$8,558.39 on drafts of the Superintendent for supplies, \$7,857.03 cash on hand, and \$100,000 paid out for dividend No. 1, leaving a balance of \$145,944.44 as the working expenses for the entire year at the mine and mills. Add to this amount \$8 per ton for milling the ore already on the dumps, and it will make \$153,844.44 as the cost of mining and milling the 7,076 tons ore of extracted, being an average of \$22.49 per ton. According to the estimate of the Superintendent there are about 14,000 tons of ore in the mine above the third level; and, as all the dead work is done down to the third level, and all the ore is ready to be stoped out, the cost for extracting and milling it should be apportioned from that already worked, which would reduce the cost below \$20 per ton; and, from careful estimates, we are confident that the cost for extracting and milling the ore for the ensuing year will not exceed \$16 per ton. On the 10th of September the hoisting works were burned down, which has delayed work for a few days; but, by the 22d of the month, they will be replaced by new works, and the work of developing the mine will then go on as usual. The loss will be about \$10,000. In the meantime the mills are reducing the low-grade ore already on the dumps. The furnaces for roasting sulphuret ore will be completed on or about the 22d of this month, when the 20-stamp mill will commence the reduction of the ore from the third level. Although expending \$222,000 in machinery and \$100,000 in dividends, the mine has never levied an assessment. It was incorporated in September, 1876.

We take the following items from the report of the Superintendent, Mr. Linkton: At the time of the incorporation of the mines of the company the Grand Prize incline was down about 50 feet and the Ethan Allen incline was down about 70 feet—the inclines being 160 feet apart. Subsequently the Grand Prize incline was continued down to a depth of 70 feet and the Ethan Allen incline to the depth of 140 feet. From the bottom of the Grand Prize incline drifts have been run west 313 feet and east 97 feet, making a total length of drifts on the first level of 410 feet. About the 1st of October, 1876, the present main shaft was started.

The main shaft is now down 55 feet below the third level, and it has penetrated the ledge about three and a half feet. The shaft will be continued down to a depth of 120 feet below the third level, and then a cross-cut will be run north to cut the ledge. On the first and second levels the rich ore body is about 200 feet in length. The balance of the ore in the first and second levels shows an assay value of about \$50 per ton. On the third level the rich sulphuret ore extends the entire length of the drift, 449 feet. The total amount of ore extracted from the mine up to this date is 7,076 tons. Of this amount 5,297 tons have been reduced at the mills belonging to the company. Seventy-five tons were sent to Winnemucca, and 54½ tons of the sulphuret ore were worked at the Leopard company's mill; making a total of 5,426½ tons worked, which produced in bullion \$546,585.93, being an average of \$100.75 per ton. There are on the dumps at the mine and mills about 1,200 tons of low-grade ore, worth about \$50 per ton. There are also on the dumps some 450 tons of sulphuret ore, which is worth at least \$200 per ton. There yet remains in place above the second level, and extending below the second level a distance of 30 feet—to the point of contact with the sulphuret ore—about 3,000 tons of chloride ore, showing an assay value of about \$100 per ton, and about 8,000 tons showing an assay value of \$50 per ton. There also remains in place above the third level, and extending up 55 feet—to the point of contact with the chloride ore—about 3,000 tons of sulphuret ore, showing an assay value of about \$200 per ton. The shaft, at a distance of 55 feet below the third level, has penetrated the ledge three and a half feet, and is not yet through it, the ore being fully as rich as it is on the third level, which gives assurance that the fourth level will be as good as the third level is, and which will add \$1,000,000 to \$1,200,000 to the value of the mine.

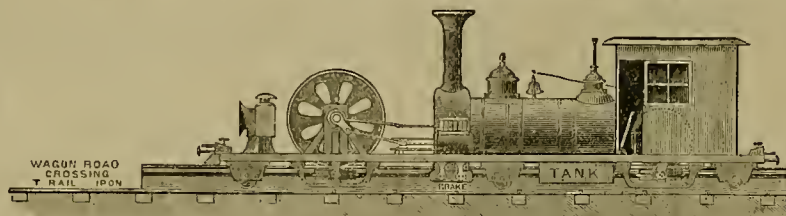
We find a total value of ore on the dumps and in the mine above the third level \$1,455,000. Add to this the prospective value of the fourth level—say \$1,000,000—and it gives us a grand total of \$2,450,000. As the company has its own mills, all the above-mentioned ore can be extracted and milled at a cost not exceeding \$20 per ton. The company now owns one 20-stamp mill, recently erected, and one 10-stamp mill, comparatively new. They are now constructing two of Howell's roasting furnaces, capable of

roasting 40 tons per day. The furnaces will be completed about the 22d of September, when we will at once commence the reduction of our sulphuret ores from the third level. The hoisting works are of sufficient capacity to work the mine to a depth of 1,200 feet. Herewith you will please find an inventory of the property belonging to the company, and supplies on hand, which make an aggregate value of \$222,502.56.

## James's Single-Track Locomotive.

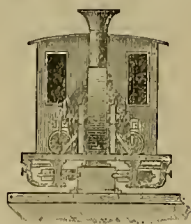
The locomotive illustrated on this page is designed to run on a single track of wood, of the dimension of 12x14 inches, including a top rail, 2 inches thick and 12 or 14 inches wide, to have a top dressing of asphaltum and other materials, or a strap of iron. The locomotive is supported by two broad-faced wheels, 12 inches on the face, with planed surface; one wheel as a driver, connected with the two cylinders, and the hind wheel (less in diameter) mounted in a frame that holds the lateral wheels, and framed into the rolling gear of a fifth wheel, allowing the locomotive to make any curve. The four lateral wheels (two on each side of the rail) impinge the side of the main stringer by the means of sliding boxes, that hold the vertical shafts of the lateral wheels, and are kept in contact with the side of the rail by elliptic springs above and below the box of each lateral wheel, as that will keep the wheels always in contact with the side of the rail, and follow the sinuosities or any deflection in the track, and accommodate themselves to any difference in the width of the main stringer. The vertical shafts of the lateral wheels will be extended up through the frame of the locomotive to receive a bevel-friction pulley, to come in contact with bevel-friction pulleys on the main driving shaft, to allow the driving power to be transmitted to them from the driver of the locomotive.

In order to ascend steep grades, the three vertical wheels on each side of the locomotive



JAMES'S LOCOMOTIVE FOR ONE-TRACK RAILWAYS.

are flanged, and only come in use at wagon-road crossings (and run upon iron rails only at the crossings) to carry the train and locomotive over the gap, which is accomplished simply by depressing the main rail to the crossing. The ends of the main rail at the crossings are leveled so that the main rail will receive the lateral wheels gradually, without any shock or jar. By the use of the six side wheels the locomotive can cross any other railroad, or run on any other railroad, as the vertical wheels are provided with flanges, and can be run on either a broad or narrow gauge by having the vertical or perpendicular side wheels the proper distance apart. The locomotive is provided with a powerful brake, that clamps both sides of the stringer, to hold the locomotive on any great descent, or stop it immediately, besides steel-hand brakes, that circle half the support wheels. The lateral wheels have also ridges that follow grooves in the main stringer, so



END VIEW OF LOCOMOTIVE.

that it is impossible for the locomotive to leave the track. The locomotive has twin tanks, that come down on each side of the main rail and under the firebox of the locomotive, that will assist in heating the water. The connection to the brakes that clamp the sides of the main stringer, and also the steel strap brake on the hind wheel of the locomotive, will be in the cab, so that the engineer will have full control of his engine.

This system of railroads is calculated to cheapen the cost of construction, and reduce fares and freights. It will be of great advantage in any country, and more especially where timber is cheap. This invention was patented, through the MINING AND SCIENTIFIC PRESS Patent Agency, by David B. James, of Visalia, Tulare county, who may be addressed for further information.

Mr. James is the inventor of an improved system of one-railed railways, which we described and illustrated in September, 1876. The locomotive described above is intended for work on a railroad of this character.

## Mining Suits.

Frank McCoppin has filed suit in the Third District Court against Mark L. McDonald, and for cause of action alleges that on the 5th of March, 1877, the plaintiff placed \$5,000 in the hands of defendant to purchase certain mining stocks, the defendant agreeing to advance any sum over and above the \$5,000 that might be required, charging therefor reasonable interest and broker's commission; that the plaintiff ordered the purchase of the following stock, viz., 910 shares of Exchequer, 200 shares of Eureka Consolidated, and 500 shares of California; that defendant purchased said stock, advancing \$9,000 of his own money; said stock becoming the property of plaintiff, subject to the lien of defendant for the sum advanced, together with \$500 interest and \$70 commissions; that on the 12th instant the defendant disposed of the stock, which was worth \$20,000, and converted the proceeds to his own use. Plaintiff therefore claims that he was damaged in the sum of \$10,000, and asks judgment for that amount.

The action brought by Mrs. Catharine Kenney to recover \$2,000 from E. J. Baldwin was tried by jury in the 15th District Court. The story of the plaintiff, as given from the witness-stand, is as follows: Two years ago she kept a little store in Sacramento, and by the industrious use of her needle, and with the assistance of her mother and sister, a small fortune of some \$2,000 was collected together. A friend of hers, named Barton, being aware what money she had, suggested that it might be greatly increased by investing in mining stocks. He said that he was anxious to obtain a loan of money from Baldwin, and if she would put her money in the hands of the latter it would facilitate his negotiations for the loan. She declined to speculate in mining stocks, but had no objections to allowing Baldwin to use her money as his own for a time if he would guarantee repayment of the principal. The next day Barton brought Baldwin to her store and introduced

him. She came to San Francisco, and, according to agreement, called at Baldwin's office, accompanied by Barton. This was on the first Tuesday of January, 1875. Baldwin said it was a good time to invest money, and exhibited to her a list of mining stocks either of which was a good investment. Plaintiff positively declined to take any chances in stock, but said if he (Baldwin) would take the money and use it as his own for sixty days, he could have it; and if it made anything she would be thankful; if not, she would take her money back at the expiration of that time. Baldwin said he had no doubt but that he could return her two dollars for one within 30 days and asked her to return at that time. She called at the expiration of 30 days, when Baldwin said things had not turned out as well as he expected, and she had better call 30 days hence. She called as requested, and was informed that Baldwin had gone to Virginia City. Again she visited his office, and was told he was in the mountains; and on the third visit, she was informed that he had gone East. When the arrival of Baldwin from the East was announced by the newspapers she called at his office, accompanied by her sister and father, who is about 85 years of age. Baldwin did not at first identify her, and she reminded him of the \$2,000 transaction. "Oh yes," he remarked, "yes—you owe me four or five thousand dollars." "How so?" was the reply. "Stocks have gone down," said Baldwin. "But I did not invest in stocks. You took my money to use as your own, agreeing to return it in 60 days," said the confiding woman. Some further conversation followed, and she left the office. On a subsequent occasion, Baldwin told her she had better give him a receipt in full and trust to his generosity to reimburse her. She replied that she had trusted to his generosity once, and would not do so again.

Baldwin alleges, in defense, that he purchased 25 shares of Ophir on a margin for the plaintiff, at her request, for \$7,312, of which sum he paid \$5,349 out of his own pocket; that the stock depreciated greatly in value, and that the plaintiff refused to pay him the balance and broker's commission. He claims that she is indebted to him in the sum of \$5,349, and asks judgment for that amount.

It came out in Mr. Baldwin's testimony that while Mrs. Kenney's Ophir stock was going down so rapidly, he had several millions in the same stock, and was making about a million a month on his investment. He also testified that he is now worth between \$8,000,000 and \$10,000,000. The arguments were concluded and the case given to the jury. After an absence of half an hour, the jury returned a verdict in favor of the plaintiff for \$2,553.

## Patents for Mining Claims.

Miners are rapidly coming to recognize the fact that when they have a United States patent to their ground, they can much more readily dispose of the same in case they desire to sell. The fact that the ground is patented in a measure guarantees that it is worth something, as few people patent mines unless there are some developments to warrant it. Every month the list of patented mines increases, and this month Copp's Land Owner gives the longest list yet of claims patented since August. The mines are as follows:

## California.

Amador county—Michael Twohig et al. and McCauley, placer mine; Oak Hill copper mining company, Oak Hill copper mine. Calaveras county—Jacob F. Myers, et al., Whiskey Hill placer mine. El Dorado county—L. C. Bateman et al., St. Lawrence, No. 2, quartz mine; Jas. M. Anderson et al., placer mine; I. C. Bateman et al., Guadalupe quartz mine. Mariposa county—C. D. O'Sullivan et al., Whitebeck quartz mine; C. D. O'Sullivan et al., Spencer quartz mine. Napa county—Pope mining company, Pope quartz and silver mine; Valley mining company, Valley quicksilver mine; Silver Bow mining company, Silver Bow quicksilver mine. Nevada county—John H. Edin, Spring Ravine placer mine. Placer county—Heirs of M. S. Page, placer mine; M. A. Wheat, Weske, No. 3, placer mine. Plumas county—Mammoth quartz mining company, Mammoth quartz mine; Ed. N. Hooper, Hooper Extension quartz mine. Siskiyou county—Oliver W. Goodall et al., placer mine; S. W. Clary, Ellis placer mine; Maurice Reener, Black and Caldwell placer mine; Jerome Beebe, Reinwald Company placer mine. Shasta county—E. M. Dixon et al., placer mine; Edward Sweeney, Hall placer mine; Emanuel Lewin et al., John Orr placer mine; John Price, Price & William placer mine; Laurent Ranzl, placer mine; Wm. T. Hyatt, Alhro & Brickford's placer mine; Michael K. Welsh, placer mine; Drury D. Harid, Bunker Hill placer mine; James Leary, placer mine. Trinity county—Morris F. Griffin, Bates & Varmater placer mine; Edward Enright, placer mine; Wm. Ware and Henry Hoenen, placer mine; Jeff Anderson et al., Sturdivant placer mine. Tuolumne county—Alexander Martin et al., Eureka quartz mine. H. F. Williams et al., Water quartz mine and mill-site company.

## Colorado.

Boulder county—Jemel Franklin, No Name lode; John P. Crotty et al., Idaho Extension lode; Henry Niekirk et al., Malvina lode; Mark Hathaway, placer mine; George H. Bachelder et al., Eureka lode; H. J. Debruyne, Prince Gold lode; Joseph Pleppier et al., Minneapolis lode; Archibald J. Vanderen, John Jay lode. Clear Creek county—Wm. G. Downing, Mormon lode and mill site; Wm. T. Chandler, Susquehanna lode and mill site; Jas. O. Stewart, Independence lode; John W. Dumont, Frank Blair lode; John W. Dumont, three claims on the Free Land lode; Wm. F. Doherty, placer mine; Thomas H. Thach et al., Cook lode and mill site; Argentine M. Co., Argus and Fortunatus lodes; Richmond S. M. Co., Star lode; Spencer H. White, John Paul Jones lode; Solomon Robinson, Mountain Ram lode; William R. Gosline et al., Erskine McLeod lode; Patrick Moulty, Jordan lode; Robert D. Morris et al., Ben Franklin lode and mill, etc.; William Mendenhall et al., Garro lode. Alpiene county—John Q. A. Rollins, Perigo lode; Quartz Hill G. M. Co., Gibson lode; Fred. T. Gooch, Perigo lode; Henry R. Wolcott, Dexter lode; United States G. M. Co., Gregory 2d and Gregory Extension lodes; Jos. Thompson, Gaston lode; Rochester City G. M. Co., Button lode; Mary F. B. Andrews, Wilbur lode; Quartz Hill G. M. Co., Stark County lode; Thos. E. Wheeler, et al., mill site; Belden & Fernal M. Co., of Colorado, George W. Ellery lode; King G. M. Co., Rochester lode; King G. M. Co., Notaway lode; Richard Mackey, Poca-houtas lode. Summit county—Boston S. M. Co., mill site.

## Montana.

Deer Lodge county—Jos. R. Walker, Alice and Valdemer lodes; Jefferson Gustavus and A. Kheru, placer mine and lode claim.

## Nevada.

Lyon county—Crowder M. Co., Crowder mine; Mennon M. C., Sheridan mine. Nyo county—Chorita M. Co., Comstock Trout mine. White Pine county—Alex. McKenzie et al., Pleiades mine.

## Utah.

Salt Lake county—Liberty E. Holden, Jordan S. M. Co. mine; John Barry, et al., Victor mine; Steven T. Mackalls, Wahoua mine. Utah county—Geo. Frey et al., Sunday mine; Miller M. & Smelting Co., first western extension of the Miller mine; Miller M. & Smelting Co., Lonto mine.

## Wyoming.

Thos. Ogg Shaw, Rawlin mine and mill site.

THE Grand Prize mine produced \$219,163 in July and August, the net product, after deducting discount and expressage, being \$195,151. The new 20-stamp mill got regularly to work on the 20th of July, and the 10-stamp mill started up on the 17th of July. Out of the above total, a dividend of \$100,000 was paid on the 10th.



### Iowa Hill Gravel Claims.

In our last issue we gave a condensation of a letter from Iowa Hill to the Dutch Flat Forum, concerning the gravel channeled of Iowa Hill, and here copy further items about the same locality from another letter by the same correspondent:

In my last letter I gave the details of our new territory of the Hogsback. Yet, although it is entirely a new field, extensive and promising in character, and naturally attracting at present the principal attention of residents and strangers, I must not allow it to overshadow other modern undertakings and improvements which I find among my mining friends in the upper section of the county. Making my headquarters at the Secret house, I find much in every direction equally worthy of notice, though less expensive and less pretensions than the operations at Hogsback.

The fact is, sir, the people of the Divide, as a general thing, are acting very nobly just now. According to our means, for we have no really rich men, and our population, which is limited, I believe it safe to say that more prospecting is going on at present in our section than any other in the county. The old sluggish inactivity so long prevailing, which induced us, as it induced Micawher, "to wait for something to turn up," has fortunately given way to a conviction that we must do something for ourselves before we can justly claim the aid of outside capital; and that conviction, thank God, is being carried out with commendable spirit.

It is right, therefore, that those hearing the hum of the struggle, whether by labor or money, for in the result there is no difference in the two, should be encouraged; it is right their operations should be described; it is right the world should know what they are doing, that when the day of prosperity comes we shall know exactly to whom honor is due.

We will again start off about a mile and a half southwest from the Secret house to Black canyon, where another new and extensive undertaking will be immediately commenced, called

#### The Bullacher Claim,

An old location, under a new organization. Mr. Bullacher, for many years a resident of Nevada county, has long held the controlling interest; but, unfortunately, associated with obstructionists and soreheads in the property, has never until lately been able to carry out his views. He has recently bought those parties out; got the property into his own hands, and formed a solid company of San Francisco men, who intend to push matters right along. There is considerable interest attached to this claim, and its thorough opening will be a matter of moment to us. The channel of which it is the outlet comes from Big Secret canyon, struck years ago by a Greek company, and known familiarly as the Whisky Hill channel. It was very rich at the inlet on Secret, yielding coarse gold in abundance; but the Greeks, with two exceptions, were a disorderly set, samples of that day, and finally over a six-ounce lump, got to fighting with knives and pistols, since which their claim has more or less lain in abeyance. In fact, the channel cannot longer be worked to advantage from Secret canyon as the rock dips right down. The old Bullacher company traced the channel carefully over Whisky hill to its outlet on Black canyon, where the same coarse gold was found, the dirt paying from \$6 to \$10 a day to the man with a rocker for a long time.

Then a small hydraulic was put up and a cut 40 feet long run with the same satisfactory results. Their money, subscribed for a larger rig, was improperly squandered by some of the company unknown to the others. Then came strife and dissensions and abandonment of work altogether. During these weary years, Mr. Bullacher has had a hard fight, but now he comes to the front again with a good company of San Francisco men to back him—by the way, that scores two for San Francisco in this section—to reap the reward of his sterling fidelity, perseverance, intelligence and determination. It is the intention of the new company to run a tunnel 400 feet, and afterwards, if found necessary, to keep up a powerful hydraulic, that the ground may be worked thoroughly and systematically for all that it is worth. In a case like this, where the ground is already tested, that is the proper way, for if a thing is worth doing at all it is certainly worth doing well.

A short distance from the inlet of this channel, on Secret canyon, to the northeast, is the

#### Index Claim,

Commenced this season by Wm. Van Vactor and some of the permanent employees on the canal, for the purpose of striking the same channel. They have strong and marked evidences of a large wash, which, after careful examinations, they conclude belongs to the Whisky Hill channel. They are in 100 feet, having probably 100 more to run. They have a handsome bank of gravel that prospects well, and the whole claim, being commanded by the branch of the canal in course of construction to Big Secret canyon, eventually will be put under the pipe.

Near the Secret house, not more than 500 yards to the south, another promising enterprise has been commenced this summer—that of opening the first quartz vein found in the immediate vicinity. It is called the

#### Rennyson Ledge,

And in which I have an interest. We sank

down some 10 feet during my visit, and found the vein large and well defined, but it is impossible to speak with certainty upon its further merits until further work reaches the vertical dip of the vein.

#### The Iowa Hill Canal.

I am happy to say the work on this undertaking, the main stay of our future on a large scale, is progressing well. The number of hands employed, white men and Chinese, is about 50, and I think they will complete doing all that is contemplated this season early in October. The object this year is simply to finish a branch ditch from Tadpole station to Big Secret canyon. When finished, on ordinarily wet seasons, this branch will give quite an additional amount of water and later in the season than heretofore, for Big Secret canyon undoubtedly commands an immense watershed. It will also confer other rights and advantages of great importance to the company hereafter.

#### An Improved Fileholder.

An article which is valuable mainly for its usefulness, if simplified without being made less effective, is improved. The fileholder illustrated herewith is an invention of this sort. Like the short horse soon carried, its operation is briefly described. Its merits, however, are not so quickly noted in words as observed by sight.

To file newspapers, or other printed matter, the round rubber hand is slipped over the inclined end of the upper bar into the notched end of the lower bar. With the lower bar resting on a table the upper bar is swung vertically or sideways, leaving the point for receiving the papers entirely unobstructed. The hinged ends of the bars, being rounded and held elastically, the upper bar is easily and naturally brought back to the right position, where it is quickly fastened by slipping the adjustable hand over the incline.



Among the advantages gained by this holder are the following:

It can be opened and closed quicker than others.

The points are less obstructed while the articles to be filed are being placed.

The papers (wholly or partly folded) can be either "straddled" over the lower bar, or filed in regular book order.

The elastic hinge and hand accommodate and hold firm either a large or small number of papers.

Devoid of surplus material, it approaches nearer to hookhinding than other fileholders.

With less material, it is lighter and less cumbersome than other holders.

It has no protruding ends to tickle the reader's ribs; no sharp corners or metal parts for defacing furniture.

It has no rigid hooks, hinges or loose parts to break or get lost.

It has proved durable in practice. Consisting of so few parts, the two strong rubber rings are the only portions possible to wear out. These can be replaced at trifling cost. The file is adjusted but 52 times a year for a weekly paper. A sample holder can be opened and closed 1,000 times without showing depreciation.

Having, as a publisher, considerable use for fileholders, the inventor could find none of the hundred different kinds patented or in use devoid of decidedly objectionable features. For this reason he adopted and used some of the simplest forms conceivable. After several years' use and repeated improvements, the device we illustrate has proved the best.

The patent was allowed in April, 1876, since which time many holders have been used, giving full satisfaction. About 100 have had constant handling in the Free Reading Room, Oakland, Cal., rendering full measure of satisfaction.

Five sizes are made to suit the dimensions of different papers, viz.: 18, 22, 56, 30, and 34 inches, inside measure.

From our own experience and the testimony of others, we do not hesitate to recommend this simple article as the best of its kind.

Patented by A. T. Dewey, S. F. Samples will be mailed from this office for 50 cents, postpaid.

WOODWORTH'S cottage, near which the "old oaken bucket" swung, is carefully preserved by a descendant of the poet. The bucket was sold long ago, but the clear, cold well remains.

### Industry Illustrated.

To every one the actual operations of labor have a fascination that even familiarity does not banish. If the spectator is even a workman of the same craft, he will stand and look on for some time to measure the amount of work done and compare it with the result of his own labor, or he will watch for anything new that may lighten the work, or render the article any better than by his own process. If unaccustomed to see such labor performed the interest is heightened by a desire to know just how the article is made and what the process is.

When the managers of the fair see this exemplified as it has been this year by the crowds of people who constantly surround the few mechanical operations shown in the pavilion, we should think they would make an effort to have more of our industrial enterprises thus illustrated. And exhibitors, too, can draw a good lesson from the same source. To be sure, it would hardly be possible to show the perpetual bay press in constant operation, nor much of the agricultural machinery, though one or two large blowers could be utilized in propelling the windmills.

To no one would the mere exhibition of Gordon's chain force have any interest were it not for the metal, fire and hoy at work there in the production of chain. And how long would any one stand around Neuman's silk exhibit were it not for the process of winding the cocoons there shown? The little engine and its train now holds hundreds interested where tens did not stop to look at it when sleeping on a block by the side of the main engine.

The coal oil stoves in operation are seen and curiously examined, while those idly standing to be looked at are casually glanced at and passed. And how much attention would be awarded to the Novato cider did not its exhibitors set it to work on the palates of the multitude?

Of course it would take room to do this, but it would pay every exhibitor to come as near as possible to showing just how he made his wares; or how his machine worked. If that could not be done, he might show the different stages of the operation. An example of what might be done in this way is shown by Mr. W. F. Palmer in his exhibit of mechanics' tools. He has in the extreme Market street end of the pavilion a fine collection of edge tools, polished and finished in superior manner, and right beside them the raw iron ore, pig iron, wrought iron, steel, etc. Then he shows the piece of iron of which a tool is made; first, cut off only, then shaped, welded ready for the steel, then united to the steel, then drawn out ready to temper and polish. All these gradations of labor he shows in connection with several different tools such as drawknives, chisels, adzes, etc.

We hope that this will be thought of at a future time, and that at our next fair the industrial pursuits and operation may be more fully illustrated.

#### Taxidermy at the Fair.

To the lovers of natural history the many specimens of stuffed animals, birds and reptiles contributed by Mr. Woodward, E. F. Lorquin, Blunt & Chapman and A. Yeoman, are a genuine treat, and may be studied for hours with both pleasure and profit. Until we have so studied them, we cannot form an adequate idea of the number of beautiful birds, etc., that the Creator has placed upon this earth to beautify and enliven its groves and hills, its meadows and plains. Mr. Woodward's exhibit of course, comes from the collection at his gardens, and is not for sale, but is nevertheless very complete and beautiful, and includes birds and animals from every clime. Among them we find the toucan from South America, that strange bird that is nearly all hill like a continental hotel; parrots from all parts of the southern hemisphere; wood-peckers to match every kind of wood known; cuckoos of different kinds, but all having the same habit of appropriating other birds' property; lyre birds whose tails are the only sign for their names; golden and silver pheasants, and birds of Paradise, male and female; and hundreds of others, common and uncommon, that takes a column of fine type simply to mention. Besides which in the same case are lion, jaguar, panther, hedgehog, armadillo, bear, seal, monkey, squirrels, etc., to the number of forty different kinds of animals; crustacea, reptiles, eggs etc., are also well represented, so that any one having taste or curiosity in this direction can spend much time pleasantly inspecting this one collection.

Passing to Blunt & Chapman's collection, or to that of Lorquin, we find many of the same birds and animals, put up for sale, and rather superior in finish and beauty. Not having been so long in case as the most of Mr. Woodward's specimens they look fresher, and not timeworn. Many of those familiar to our eye, are elegantly preserved both in position and proportions, and the colors preserved wonderfully brilliant. No one need go abroad to obtain taxidermists' skill, for these gentlemen fully evidence their adeptness by their exhibited specimens.

A. Yeoman also exhibits a few pieces of his own work, below our stand in the same aisle,

consisting of the California tree grey squirrels, owls, etc., that are exceedingly spirited and life like. The squirrels are very fine in position and expression. Children take great delight in looking at the latter, and one little cherub wanted to stay there all the evening to see if "dey won't hop."

#### An Oregon Mining Ditch.

The Oregon Sentinel says: Work on the Sterling water ditch is progressing rapidly. About 400 men are employed along the line, and the company expect to commence mining operations about the first of December. The estimated cost of the ditch is \$35,000. The company paid \$25,000 for their mining ground, and it will cost in the neighborhood of \$10,000 to purchase and place in position pipes and other operatives for mining purposes. This is one of the greatest mining enterprises ever undertaken in Southern Oregon, and its success is by the company considered certain. A steam sawmill was, a few days ago, transported to the grounds of the company to furnish lumber for fluming and other purposes. Southern Oregon is known to be rich in the precious metals, and for years has been awaiting the enterprise and capital of such men as D. P. Thompson & Co., of Portland, who have undertaken this mammoth work, and, with their characteristic energy, are pushing it to rapid completion. A happy consummation is devoutly to be wished, as it will not only advance the interests of the company, but the prosperity of the whole country. A brighter future is certainly awaiting this section in the unfolding of our undisputed natural resources. The attention of capitalists is turned thitherward, and our gold-hedged hills must again admit the sway of the miner, and yield their treasure to enterprise and spirit.

CHARCOAL KILNS.—Henry Allen, the well-known contractor of Eureka, has just finished a work of considerable magnitude at Hot creek, 22 miles from Tyho. Last summer he was employed by the Tyho Consolidated company to build 15 kilns, in which the company proposed to burn the charcoal necessary to supply their furnaces at Tyho. He finished the work about one week ago, and the company were delighted with his work, and paid him a high compliment on his skill and energy. Some idea of the magnitude of the work can be gathered from the fact that 600,000 bricks were used in building the kilns. They are oval in shape, having a diameter of 25 feet. Each one has a capacity of 1,400 bushels, turning out that quantity of coal to each charge, the operation consuming just five days. A great economy of time is gained by using the kilns, instead of burning in the old-fashioned way, and, as the company owns a vast quantity of wood in the immediate vicinity, they calculate on their fuel costing them about one-half of the usual rates. Mr. Allen kept a force of about 20 men employed at the work for about three months, and finished his contract inside of the time allowed him by the company.—Eureka Sentinel.

#### UNITED STATES

#### Mineral Land Laws, Revised Statutes, AND INSTRUCTIONS AND FORMS UNDER THE SAME.

We have just issued a pamphlet containing the General Mineral Land Laws of the United States, with Instructions of the Commissioner of the Land Office. The contents of this pamphlet comprise all of the Government laws with relation to mineral lands of interest to the mining community, as follows: Mining Statute of May 10th, 1872, with Instructions by the Commissioner of the Land Office; Mining Statute of July 26th, 1896; Mining Statute of July 9th, 1870. Forms required under Mining Act of May 10th, 1872, as follows: Notice of Location; Request for Survey Application for Patent; Proof of Posting Notice and Diagram of the Claim; Proof that But and Notice remained Posted on Claim during Time of Publication; Registered Certificate of Posting Notice for Sixty Days; Agreement of Publisher; Proof of Publication; Affidavit of \$500 Improvements; Statement and Charge of Fees; Proof of Ownership and Possession in Case of Loss or absence of Mining Records; Affidavit of Citizenship; Certificate that no Suit is Pending; Power of Attorney; Protest and Adverse Claim; Non-Mineral Affidavit; Proof that no Known Veins Exist in a Placer Claim, etc. There is also given the U. S. Coal Land Law and Regulations thereunder. The work comprises thirty pages, and will be sold, post-free, for 50 cents. It should be in the hands of every one having any mining interests. DEWEY & CO., Publishers of the MINING AND SCIENTIFIC PRESS, S. F.

#### Contents of Pamphlet on Public Lands of California, U. S. Land Laws, Map of California and Nevada, Etc.

Map of California and Nevada; The Public Lands; The Land Districts; Table of Rainfall in California; Counties and Their Products; Statistics of the State at Large.

Instructions of the U. S. Land Commissioners.—Different Classes of Public Lands; How Lands may be Acquired; Fees of Land Office at Location; Agricultural College Script; Pre-emption; Extending the Homestead Privilege; But One Homestead Allowed; Proof of Actual Settlement Necessary; Adjoining Farm Homesteads; Lands for Soldiers and Sailors; Lands for Indians; Fees of Land Office and Commissioners; Laws to Promote Timber Culture; Concerning Appeals; Returns of the Register and Receiver; Concerning Mining Claims; Second Pre-emption Benefit.

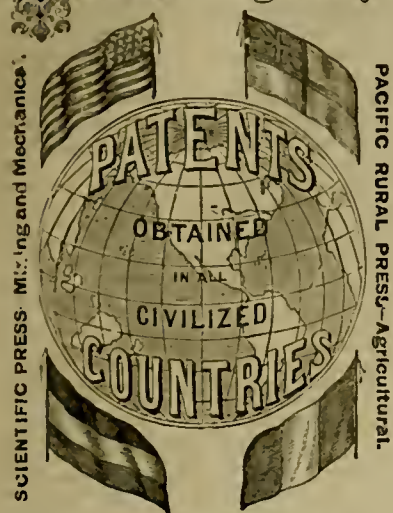
Abstract From the U. S. Statutes.—The Law Concerning Pre-emption; Concerning Homesteads; Amendment Act Concerning Timber; Miscellaneous Provisions; Additional Surveys Land for Pre-emption, List of California Post Offices. Price, post paid, 50 cts.

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SAMPLE COPIES.—Occasionally we send extra copies of this paper to those we believe would be benefited by subscribing for it themselves, or who are willing to hand the paper and speak of its merits to others. We call the attention of such to our prospectus and terms of subscription.



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DEWEY & CO., Patent Solicitors.  
San Francisco, 1877.

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SAN FRANCISCO, CAL., Jan. 23d, 1877.

MESSEURS DEWEY & Co.—Gentlemen: I received to-day my patent papers for my improved feed-boxes, which you have so kindly worked through for me, and I wish to add my testimony to that of your many other patrons as to your promptness and fair dealing in every respect. Thanking you for prompt attention to business in my case, I heartily recommend you to those in need of a patent solicitor, in preference to the many Eastern firms who flood this coast with their circulars and representations of cheap fees, etc. Again thanking you, I remain respectfully yours,  
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Through whom we are able to promise to our readers so much that cannot be collected in the mere routine of office work. By the aid of such help our editors will be able, during the coming months, to do more than ever in furnishing information which shall be

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And which shall comprise all that is known of the latest and best means for saving gold and silver, and for economizing labor and cost in that direction.

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Will also largely occupy the attention of the publishers and editors, and will be constantly encouraged, as an important means of furnishing employment to those who are seeking our shores, and adding to the wealth of the Pacific coast.

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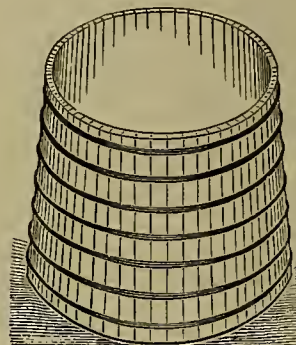
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Continued from Page 181.

peet mountain and vicinity are being received. The southern portion of the district is fast regaining its former buoyant aspect, and the business men and property holders in that locality are much encouraged at the outlook.

**THE HAMBURG SHAF**—Good progress is being made on the main shaft of the Hamburg mine. The contractors are sinking at the rate of three feet per day, and will soon finish their job. About 35 feet further distance will bring them to the 450-ft level, when connections will be made with the drifts from the Friday shaft.

**ESSEXITE CHARTER.**—The crushing of the Mineral Hill ores at the Lemmon mill was finished on Saturday evening, and the deputation have started for their homes, their pockets lined with a liberal amount of coin, the product of their summer's labor. We are informed that the boys are well pleased with their treatment by Messrs. Clark & Wallace, and state that all of the ores run through the mill returned a much higher average of bullion than they expected. Some of the rock worked over \$200 per ton more than the shippers anticipated, and every facility was extended to them in the way of sampling the ores as they passed through the batteries. The mill company guaranteed a return of 82% on all rock going \$200 per ton, and 80% on ores falling below that figure. The shipment was worked above this percentage, and everybody is satisfied with the results. We hope to see the boys again, and presume they will pay us another visit as soon as they develop a few more rich pockets.

#### HUNTER DISTRICT.

**THE HUNTER CO.**—Pioche Record, Sept. 15: From Mr. James Day, we learn the following particulars in regard to Hunter district: The Hunter Co. mining company, of White Pine county, a San Francisco and London incorporation, will start up a new 40-foot hydraulic fan mine about the 20th of this month. In the Crown Point mine, belonging to this company, a large chimney of ore has been followed a distance of 115 feet, commencing 100 feet below the surface. Its dip is to the south. This ore averages 250 ounces of silver and 17% lead. Assays from face on the first of month, 359 ounces. This company also owns the Vulcan mine, in which very important developments have been made recently, and six other mines, all of which are well developed ledges have already been opened, and the prospects for the camp are most flattering. He confidently expects it to rival the Comstock. Last June there were only 500 men in Tuscaraora. Now there are 1,500 and more coming. Business is brisk and all seem to have money. The only trouble is to obtain lodgings. The influx of men is so great that there are not houses enough to accommodate them.

#### TUSCARORA DISTRICT.

**A PROMISING CAMP.**—Gold Hill News, Sept. 14: Prof. W. Frank Stewart returned from Tuscaraora this morning. He says he has located enough mines since leaving the Comstock to make the whole country rich. He speaks encouragingly of Tuscaraora district, and says it is the only place left in which to get even. The mines there are showing up handsomely and giving employment to a great many men. Several well developed ledges have already been opened, and the prospects for the camp are most flattering. He confidently expects it to rival the Comstock. Last June there were only 500 men in Tuscaraora. Now there are 1,500 and more coming. Business is brisk and all seem to have money. The only trouble is to obtain lodgings. The influx of men is so great that there are not houses enough to accommodate them.

#### Arizona.

**MINING NOTES.**—Arizona Enterprise, Sept. 15: The news from the mines still continues to be of an encouraging nature, and work is rapidly progressing in the various districts. The Iron Horse, the north tunnel is now in the neighborhood of 400 feet, and will soon tap the shaft at a depth of 312 feet. There is no change in the character of the ore body, which is high grade.

**THE DOYLE,** which is also in Peek district, is one of the best prospects in that vicinity. The shaft is now down 35 feet and shows a two-foot pay streak of ore, going about \$200 to the ton. Work is temporarily suspended on the Silver Prince.

**HASSAYAMPA,** one of the most promising mines is the Perry, discovered a few months ago, and located by Messrs. H. Leighton, J. A. Park and T. Otto. The tunnel is now in between 35 and 40 feet, and shows a well-defined pay streak of high-grade sulphide and galena ore. This mine is situated about eight miles south of Prescott, and is justly considered to be one of the best prospects in Hassayampa district. Work is temporarily—steadily progressing on the Silver Prince, and some very fine ore is being taken out, but the mill is shut down for the present, owing to the scarcity of water.

**THE CROOK** mill is also shut down for the same cause, but Taylor and Sheldenbrand are at work on the mine, and have some very fine ore out.

In Turkey Creek district, Dave Neagle has a force of men at work upon the Goodwin, and is now down 125 or 130 feet. The pay streak is widening as the shaft gets deeper. The new two-story mill will be on the ground in a few days. It has a good roaster and is complete in every respect. John Holmes is at work upon his location, and has some of the best ore yet found upon the Goodwin. Ward & Co., on the Peerslee, are now down about 60 feet, and have a good streak of high-grade chloride and carbonate ore. The shaft on the Trinity is down over 40 feet, and makes a better showing than ever. The pump, hoisting works, etc., are put up on the Tiger, and pumping has been commenced. So soon as the water is taken out, sinking will be commenced immediately.

#### Idaho.

**KNOTT'S MINE.**—Owyhee Avalanche, Sept. 15: The excitement in regard to the rich discoveries in the Black Jack mine, on Florida, still continues, and the prospecting continues the ledge grows larger, and the outlook continues more promising. It is one of the best defined veins ever worked in this vicinity, and the indications are that it will turn out to be an immense bonanza.

**GAMBRINUS DISTRICT.**—Idaho World, Sept. 11: The Gambrinus district is looking up. All the mines are being worked to the best advantage, and everything in that section presents a cheerful and active appearance. As a tip from Lu Bonnett rock was made at the Ploverman mill a few days ago, and the result was satisfactory. The next run in the Ploverman mill will be from the O'Neill ledge, which was proven by a crushing made last fall to be very rich. When that rock is crushed a run will be made from the Forest King, from which big results are anticipated. No rock, as yet, has been worked from that mine, it being a late discovery, but the prospects are such as to leave no doubt of the anticipated results. Robbins & Co. are sinking a shaft on the Golden Gate. The rock taken from the shaft is fully as good as that on the surface. They will sink the shaft to the depth of 60 feet, and then commence stopping. Mr. Ploverman is taking out good rock from the Magna Charta. He has put a whim on the Gambrinus mine for raising the ore through the old shaft. The Sub Rosa mill is working to a charming and successful result. The mine is looking splendid, and there is ore enough in sight to keep the mill running steady for months. Tinscher & Co. have commenced sinking a shaft on the Ida Poland, and are taking out good ore. The road to the mine is completed; also the branch roads to the other mines. The prospects in the district are indeed very encouraging. Ore from all the mines there, with the exception of those lately discovered, has been worked and found to be rich, results of from \$40 to \$300 per ton having been obtained; and as the rock contains nothing but free gold, it can be worked at a very low rate, custom rock being crushed for \$5 per ton. The newly-discovered ledges respect fully as well as those that have been worked.

#### Utah.

**BEAVER.**—Cor. Salt Lake Tribune, Sept. 15: The Frisco furnace is to be rebuilt.

The Shambles and Millford furnaces still remain shut down, and there is some talk of their remaining so until the first of January next, unless lead should take a big rise. The mines look encouraging and work still goes on. The tunnel being run from the Elephant mine is now in

nearly 250 feet, with good prospects of ore. This is one of the best paying mines in Star district.

The Wasco still continues to improve as it goes down. This is now the deepest worked mine in the district, and the ore is of good grade and smelts very easy.

**TRINITY.**—The mines in this district that are working are all doing well, and every foot they go down only serves to prove their growing richness.

The Crismon is turning out gold so fast that its little mill is unable to handle it, and there is some talk of increasing its capacity immediately.

The Shoebridge mill found that it had not drying capacity enough to handle the ore offered, and has been making extensive improvements in dry kilns and ore houses, and has none too much capacity now to handle the ore that will be produced this month.

The Consolidated Julian Lane mine is now working about 30 men, and is producing a large quantity of high grade ore. They have adopted the tribute system—that is, giving the men in small parties certain portions of the mine to work and have a share in the profits. It works well.

The Golden Treasure and Tesora, lying north of the Julian Lane, are both working good forces of men, and are producing a fine amount of first-class ore.

There are a great many smaller mines and prospects, owned by poor men in this district, on which the owners are doing such work as they can afford, and, as a general rule, they are paying for the labor expended on them.

**NEW STRIKE.**—Another rich gold strike is reported in the Crismon Mammoth mine, in Tintic. It is of the same character as the first strike, the rich streak being four feet wide, and runs up into the thousands, while the whole vein, the width of which we believe is not yet determined, samples \$600 per ton at the company's mill.

We understand that the owners of this valuable property have determined to erect a 20-stamp mill, between the present time and next spring, a site near the mine having been already selected. If this property ever falls into the hands of California men, it will become the wonder of the mining world.

#### Our Paper Mills.

Near our stand in the pavilion is a small but elegant exhibit of the productions of our paper mills, which industry is fast assuming a position of importance among our manufactures. We believe there are five mills engaged in the manufacture of this article in this State, whose capacity and location are as follows: Eagle mill, Point Arena, straw paper, 25,000 reams per month; Pioneer mills, Marin county, printing and manila paper, 65,000 pounds; Stockton mill, printing, 90,000 pounds; Saratoga mill, straw, 5,000 reams; Lick mill, Alviso, straw and manila, 5,000 reams. A large new brick mill is now being erected at Stockton for the manufacture of news paper, that is to have a capacity equal to all the foregoing mills combined, and is expected to be in running order about February next. It is to run on tule as a material.

Straw paper wholesales at about 85 cents per ream, and retails at \$1, though heavier paper rates at 15 cents more per ream. This manufacture utilizes a large amount of oat straw in Marin and Mendocino counties, where the most of this brand here used is made, which would otherwise be left on the ground to rot or be burned.

The process of making paper is quite interesting when seen for the first time. In brief, the materials are ground to a pulp, and then strained, and what is retained on the strainer is the paper. That is the way it appears to a novice, and yet this simple operation requires a great deal of complicated machinery that we have not space to explain here. Paper or papyrus has been known to writers for ages and ages, as even the ancient Egyptians made a fair article from the "tule" of the Nile. Our ancestors used mostly parchments made of sheepskins. In the early days of paper proper, only the best of material was used to manufacture it of; first linen, then cotton; now almost anything will do, as we use straw, wood, tule, cactus, many kinds of weeds, and almost any light-colored substance that can be pulped.

In the paper business of this city, Messrs. S. P. Taylor & Co. take the lead in handling the home-produced article, and are agents for the most of our mills. With so much competition in this business the profits of the smaller mills have been very light to manufacturers, and some of these mills have repeatedly changed owners on account of exhausted bank accounts. Now the price is very low, but the falling prices of labor are assisting the proprietors of the mills, so that they are still enabled to run. Messrs. S. P. Taylor & Co. have a large establishment at No. 416 Clay street, well stocked with all grades and varieties of printing, straw, Manila, and wrapping papers, as also blank hanging paper, paper bags, etc., and supply any order at short notice. They can always fill the largest order at a comparatively short notice, even if they have not in stock a shipload of it. Prompt attention to business, fair dealing, and moderate demands for profit, have made them popular with producer and consumer.

They make a small but elegant display of blank hanging papers in rolls, printing paper, straw, manila, and colored wrapping papers, near our stand in the pavilion, and might fill all the space that could possibly be accorded them with specimens of different kinds, but it was considered needless.

#### New Incorporations.

The following companies have filed certificates of incorporations in the County Clerk's office, at San Francisco:

**SOUTH STANDARD M. Co.**—Sept. 18th. Location: Bodie district, Mono county. Capital stock, \$5,000.00. Directors—C. C. Stevenson, C. H. Golding, Wales L. Palmer, Israel W. Knox and C. A. Sankey.

**OLIMPALE S. M. Co.**—Sept. 18th. Location: Nevada. Capital stock, \$10,000.00. Directors—M. R. Roberts, M. G. Cobb, I. P. Rankin, J. P. H. Wentworth and L. Francis.

**PEER M. Co.**—Sept. 15th. Location: Arizona. Capital stock, \$10,000.00. Trustees—Wm. Sherman, T. L. Taylor, E. G. Peck, J. Garter, C. C. Bean, T. M. Alexander and B. W. Mudge.

**SHAWMUT M. Co.**—Sept. 17th. Location: Inyo county. Directors—Z. E. Spaulding, T. J. P. Lacy, D. H. Ward, J. W. Ward and J. T. Ward.

#### About Printing Inks.

The perfection to which the typographic art has been carried in this country is one of the notable things which mark the present age. The improvements in printing presses, in type, stereotype and electroplate, wood engravings, etc., have been heralded through the public journals until every one who feels any interest in the progress of mechanical and artistic work is acquainted with them; but there are some of the accessories to fine typography, usually looked upon as secondary in importance, which are really essential to the production of work of a superior character. The most costly presses, the finest type and wood-cuts, the handsomest paper and the greatest skill on the part of the printer, will all be in vain if the ink used be of an inferior kind, and all persons familiar with this great art know how to appreciate fine ink.

Very few people have much idea of the method of manufacture of printing ink, or of the varieties that are made. These inks have to be made of every conceivable shade to suit the fastidious public, and have to be made at all prices to suit the purses of the printers themselves. A man desiring a job done, and wishing a cheap one, will naturally get it done with cheap and poor ink, for, all told, this material requires an inconsiderable expenditure in a year in a printing office. For a good job, good ink must be used, for even the best printer can do nothing without it.

Printing ink is a preparation very different from any of the inks used for other purposes, and its manufacture demands no little skill and experience. It should be of a soft, adhesive character, readily attaching itself to the surface of the types, and as easily transferred to the paper pressed upon them, conveying in a clear tint the exact stamp. Thus spread on a thin film and pressed into the paper it should quickly dry, and at the same time be so incorporated with the paper as not to be removable by mechanical means, while its composition ensures for it durability and a power to resist the actions of chemical agents as well as atmospheric influences. While disposed to dry readily on being applied to paper, it should retain its softness in the mass, and while excluded from the air in this condition undergo no change. Its ingredients must not be of a corrosive nature, to injure the rollers employed in spreading it.

The appearance of good ink is glossy and somewhat oily; its texture without grains; and its tenacity such as to cause it to adhere to the finger pressed against it, and yet leave but a short thread suspended from a portion taken out.

The usual materials employed in the manufacture are linseed oil, resin and coloring matters. Resin oil is largely used in the manufacture of the cheaper inks. For the best inks the linseed oil is selected of the purest quality and clarified. Lampblack is almost universally employed as the coloring matter, and much care is given in the manufacture of this article to obtain it of the very best quality. Other carbonaceous blacks reduced to impalpable powder are sometimes employed. For colored inks various pigments are introduced instead.

A great variety of qualities of inks as well as of colors are made; and as before stated as much depends on the ink as on the presswork in a first-class job.

One would hardly suppose before looking over the catalogue of such a manufacturing house as that of C. E. Johnson & Co., New York and Philadelphia, to what an extent and variety the business of manufacturing printing inks is carried on. The inks made by this house are now in almost universal use, being uniform in quality and meeting the requirements of the trade. The firm at present is Chas. E. Johnson & Co., and the principal is the third generation of those who have conducted the concern. His grandfather, Charles Johnson, who established the business started it in January, 1804; he was succeeded by his son, Charles Johnson. He in turn has been succeeded by his son, who now manages the business with such success that he has found the demand for his inks from New York and the Eastern States so great as to render it necessary to open a branch establishment in the city of New York. This old established house has kept pace with the march of improvement in the manufacture of printing inks—in fact has led it—until now their products can not be surpassed in this country or Europe. They manufacture every kind and style of printing ink known, making a specialty, however, of inks of the first quality. It is seldom in this comparatively new country that one sees an instance of a manufacturing industry continued for so long a time under the management of one family; and it argues that they understand their business thoroughly and satisfy their customers, or it would have passed into other hands before this.

Their inks are not unknown on this coast. For several years we received them through H. S. Crocker & Co., of San Francisco. They invariably gave us satisfaction. Lately we have used a higher grade of ink of Johnson's, and we say emphatically it is the best and most satisfactory in quality and prices of any. Our present issue illustrates well its character, and for the satisfaction of our readers we will say we expect to use none other for a long time.

#### The Union Iron Works.

The Union Iron Works, Prescott, Scott & Co., make the most extended exhibit of castings and machinery of any of the foundries. Among the articles shown are an air compressor, large horizontal engine, several vertical engines of different sizes, a little five-stamp mill, a hoiler feed pump, baby hoist, pans and settlers, several large sized valves, etc. The Union Works are now fitted up with machinery, tools, etc., of sufficient size and capacity to turn out any class of work. They make a specialty of mining machinery, and have made some of the largest mill, pumping and hoisting machinery in the world. Within the past two or three years there has been made at these works some magnificent specimens of mechanical skill in this line, most of which is now in operation at the mines on the Comstock lode.

This institution is the oldest of the foundry and machine shops on the coast, having been originally founded in 1849 by James and Peter Donahue. The first casting made in the State was made at these works, and is exhibited at the fair. It was cast for the propeller McKim, and cost fifty cents per pound. These works have been conducted by several firms, the present one being styled Prescott, Scott & Co., and composed of G. W. Prescott, Irving M. Scott, and H. T. Scott. Irving M. Scott superintends the mechanical branch of the business, which is a sufficient guarantee in itself that the work turned out will be first-class in every respect.

The machine, hoiler, blacksmith shops and foundry are fitted up with the best modern machinery, and all the appliances are the best that can be obtained. A specialty is made of heavy work of all kinds. The institution employs about 500 men, and pays out \$250,000 a year for labor alone. These works first introduced puppet valves on this coast and also the system of direct acting pumping and hoisting engines for mines, and, in fact, have inaugurated many other important improvements. From the nature of the products comparatively small exhibits only could be made in the fair, but the various engines, etc., shown, will stand close criticism for skill in workmanship.

#### Salamander Felting.

Seward Cole, of the Salamander Felting Co., makes a very interesting exhibit of different qualities of asbestos at the fair. There are specimens from Amador, Butte, Santa Barbara, San Diego, Calaveras, Placer, El Dorado, Los Angeles, and Merced counties. There are also some from New York, Tennessee, Maryland, and some Italian. The asbestos from Los Angeles and Butte counties is very fine and soft, and that from Colfax, Placer Co., also. It is very white and is long fibre. Some of that exhibited is of a brownish tint. Mr. Cole also exhibits asbestos cement, asbestos hoard and salamander felting. The display of this peculiar California product is the best ever made here.

This latter substance is intended for covering boilers, steam pipes, etc., for preventing loss of temperature and condensation of steam. It is exhibited in practical use on various pipes, etc., about the building. It is composed of asbestos and other fire-proof and non-conducting material, and is the best substance for coating steam boilers yet discovered. It can be applied while the boiler is hot, so it does not interfere with use. It is susceptible of a smooth and beautiful finish and may be painted or ornamented in any tasteful manner.

This felting has much to do with preventing loss of power. It has been applied with satisfaction to hundreds of steam boilers and steam machinery of every description; to hot water pipes in hotels and private houses; to hot air and blast pipes, locomotives and steam threshers, also to various other purposes, as roofs, fire-proof window shutters, ranges, stoves, ceilings, safes, and, in fact, all places where it has been desirable to prevent the radiation of heat. In addition to these advantages it is very light, does not crack or crumble off, and preserves iron from rust and corrosion. It is entirely indestructible by fire.

**THE HOPE IRON WORKS** exhibit in the machinery department two propellers, which are entered for competition. Mr. Wallace Hanscom, the proprietor of the works, has made a specialty of this class of castings, and has had a great deal of experience with them. Those exhibited are of small size, but excellently made. Wm. Hanscom drafts and designs these propellers himself, and superintends their manufacture, and as he is thoroughly posted in the requirements for various styles of vessels, he has a great deal of such work to do. There is also exhibited a steam pump by Geo. E. Cavis, from the Hope Iron Works, which can be examined by those interested in such machinery.

**THE EUREKA SENTINEL** says that the Western Union telegraph company has resolved to place the new and thriving town of Tuscaraora in telegraphic communication with the rest of the world, and that the work will be commenced at once.

**THE CHINESE** quarter at Grass Valley was burned out on Monday night, with a loss of over \$20,000 and no insurance.



## General News Items.

The weather of the past week has been the hottest of the year. The highest range of the thermometer was 93°.

The Americans won the international rifle match at Creedmoor. Grand total—3,334 for Americans, and 3,242 for British. Americans won by 92 points.

The demand of the miners who struck for a restoration of the wages paid last May at Hazleton, Penn., and a percentage on any advance of coal above \$3.25 at tide, has been allowed and the strike ended.

A special from Frankfurt states that one of the oldest Frankfurt banking firms, Drennau, Mertens & Co., have failed. Liabilities amount to 5,000,000 marks.

The State tax levy for the fiscal year 1877-78 has been fixed at 63 cents on the \$100, against 73½ cents last year. This, with the city and county tax, makes a total tax for San Francisco, this year, of \$1.83 on the \$100.

The Telegraph publishes a dispatch from Stanley, the African explorer, dated Embombo, in Congo, West Coast of Africa, August 10th. He states that he completely navigated the Luabala, and has succeeded in proving it to be identical with the Congo.

There are now only 17 cargoes of California wheat and flour en route to Europe, of which seven belongs to the crop of 1876. From this time on the departures hence will exceed the arrivals out, and the fleet afloat will therefore steadily increase for the next six months.

ARRANGEMENTS are being made for an exhibition of dogs, to take place in this city some time next month, and to be conducted in much the same way as those that have been attended with so much success in New York, Boston and London. The pavilion has been engaged for the purpose.

The United States Supreme Court opens the October session on the 8th, proximo. Its docket is nearly three years behind, and the accumulation of business is constantly increasing. Prominent members of the Bar contemplate urging Congress to provide a Commission of Appeals to assist in cleaning the docket and relieving the Court of its pending burden of business.

DR. JOHN W. FOYE, resident physician at the small-pox hospital, on 26th street, reports to the Supervisors on the working of that institution during the past year: Whole number of patients treated, 875; number of deaths, 245. Of the 875 cases, 403 were natives of the United States, including 153 of California, and 472 were of foreign birth. Of 245 deaths, 119 were natives of the United States, including 47 born in California, and 120 were foreign born.

The Pacific United Workmen's Furniture Manufacturing Company, Brannan street, has closed after five years' running, the concern not proving profitable. All the workmen engaged in the enterprise had an equal interest in the management of the business, and consequently there was no responsibility. No workman could be discharged, and the rate of wages, which was always high, was fixed by a Board of Directors. The stockholders lost about 25% of their investment.

CRAZY HORSE, who was recently killed at Camp Robinson, had, although a young man of but 26 years of age, distinguished himself as "The Fighting Chief" of Sitting Bull's band, and in that capacity served at the Custer massacre. A few months later, he came into the Agency with a portion of the hostile band. They were all disarmed and dispossessed of their ponies, and since that time Crazy Horse has been chafing under his helpless condition, and lately made a break for liberty, which ended in his death.

ON the 18th instant, the East-bound passenger train which passed Cheyenne at 3 P. M., was stopped and robbed by 13 masked men at Big Springs, Nebraska, 160 miles east of Cheyenne. The robbers first took possession of the station at Big Springs, destroying the telegraph instruments and compelling the agent to hang out a red light. When the train stopped, the robbers took possession, putting the train men and passengers under guard. The express car was broken into, and the safe robbed of about \$75,000. The passengers were also robbed. A freight train overtaking the express, its engine was sent to Ogallala, from whence a report of the robbery was made. The robbers are believed to have gone north. The Railroad Company offer a reward of \$5,000 for the arrest of the thieves.

**BULLION SHIPMENTS.**—Since our last issue shipments of bullion from prominent mines have been as follows: California, Sept. 12th, \$176,254; Tybo Con., 11th, \$8,524.70; Northern Belle, 13th, \$6,603.97; California, 15th, \$107,041.73; Con. Virginia, 15th, \$151,255.24; Martin White, 10th, \$8,027.01; Arizona, 16th, \$1,647.01; Standard 16th, \$38,339.76; Arizona, 17th, \$914.12; Endowment, 17th, \$1,884.98; California, 18th, \$182,483.33—total to date, \$465,879.90; Con. Virginia, 18th, \$147,895.16—total to date, \$299,180.40; Endowment, 20th, \$2,273.75.

LEAD has further fallen in Liverpool to \$19 17s. 6d. to \$20 5s. per ton for good ordinary brands.

## Agriculture at the Paris Exposition.

We have heard talk of the representation of some of our best California products and manufactures at the Centennial Exposition of 1878. It would be a point which men in some of our branches of production and manufacture could ill afford to lose. In wines, in dried fruits and in other specialties we are in competition with France. A world of customers for such articles will come to Paris, and if we can turn out anything which will do to compare with the French, this is the opportunity to catch the eyes of buyers and to advertise our products where it will do most good. We trust that something will be done in the way of having California well represented at Paris next summer.

We learn from our foreign exchanges that the rulers of the affairs propose to be liberal in their awards for excellence in agricultural productions. A decree has been issued by the French Minister of Agriculture and Commerce, from which it appears that a sum of 1,500,000 francs is to be set aside for providing prizes and medals to be distributed at the forthcoming Paris International Exhibition. The prizes will be awarded by an international jury of 650 members, of whom 300 will be French, and 350 foreigners, the latter to be nominated to the office of jurymen by their respective governments. Their labors will extend from the beginning of June to the end of August, and the prizes will be distributed among the successful competitors on September 10th, 1878. Among the awards placed at the disposal of the jury for excellence in agricultural and industrial products are 100 large pieces of plate, 1,000 gold medals, 4,000 silver medals, 8,000 bronze medals, and the same number of "honorable mentions."

**ORDERED TO LEAVE.**—The meeting at Roseville on Monday night resulted in the Chinamen being ordered to leave. A number of armed men went to the different Chinese mining camps on the Auburn road, at which were some 60 men, who were ordered to leave. These proceedings were brought about by the murders committed at Rocklin by Chinamen. Every house in Chinatown was destroyed, and the occupants driven out of Rocklin.

**STILL AT THE FRONT.**—The meeting at Roseville on Monday night resulted in the Chinamen being ordered to leave. A number of armed men went to the different Chinese mining camps on the Auburn road, at which were some 60 men, who were ordered to leave. These proceedings were brought about by the murders committed at Rocklin by Chinamen. Every house in Chinatown was destroyed, and the occupants driven out of Rocklin.

WOODWARD'S GARDENS has the following new attractions: The buffalo chase; large whale skeleton; new museum; improvements in the zoological department, besides the other features which have made it popular.

## Signal Service Meteorological Report.

Week Ending September 18, 1877.							
Sept. 12	Sept. 13	Sept. 14	Sept. 15	Sept. 16	Sept. 17	Sept. 18	
20.00	30.06	30.11	30.01	20.80	29.83	29.87	
29.84	29.99	30.01	29.80	20.82	29.82	29.81	
MINIMUM AND MAXIMUM THERMOMETER.							
67	73	78	80	90	02	83	
54	64	67	60	63	05	61	
MEAN DAILY HUMIDITY.							
70	67	58	52	45	41	58	
PREVAILING WIND.							
SW	SW	W	W	NW	NW	W	
WIND—MILES TRAVELED.							
245	146	162	149	151	112	130	
STATE OF WEATHER.							
Clear.	Clear.	Clear.	Clear.	Clear.	Clear.	Clear.	
RAINFALL IN TWENTY-FOUR HOURS.							
Total rain during the season, from July 1, 1877, 0.02 in.							

## LEATHER.

(WHOLESALE.)

WEDNESDAY M., September 19, 1877.

Sole Leather, heavy, lb.	25 @ 23
Light	22 @ 21
Jodot, 8 Kil. doz.	22 @ 21
14 to 13 Kil.	22 @ 21
14 to 13 Kil.	22 @ 21
Second Choice, 11 to 16 Kil.	22 @ 21
Cornellian, 12 to 13 Kil.	22 @ 21
14 to 13 Kil.	22 @ 21
Simon, 18 Kil.	22 @ 21
20 Kil.	22 @ 21
24 Kil.	22 @ 21
Robert, 7 Kil. and 9 Kil.	22 @ 21
Kilg, French, lb.	1.00 @ 1.35
Cal. doz.	4.00 @ 4.50
French Sheep, all colors.	8.00 @ 15.00
Eastern Cal. for Backs, lb.	9.00 @ 12.00
Shoe Horn for Topping, all colors, doz.	5.00 @ 5.25
For Linings.	5.00 @ 5.25
Cal. Russet Sheep Linings.	1.75 @ 4.50
Boat Legs, French Cal., pair.	4.00 @ 4.25
Good French Cal.	5.00 @ 5.25
Best Jodot Cal.	5.00 @ 5.25
Leather, Harness, lb.	35 @ 38
Fair Bridle, doz.	48 @ 72.00
Sleight, lb.	35 @ 37
Welt, doz.	30 @ 50.00
Buff, ft.	18 @ 20
Wax Side.	17 @ 18

## Gold, Legal Tenders, Exchange, Etc.

[Corrected Weekly by SUTTS &amp; CO.]

SAN FRANCISCO, September 19, 3 P. M.  
LEGAL TENDERS IN S. F., 11 A. M., 97½ @ 97½. SILVER, 49½ @ 49½ GOLD IN NEW YORK 103.

GOLD BARS, 900 SILVER BARS, 92½ @ cent. discount.

EXCHANGE ON NEW YORK 1½; on London bankers, 49½; Commercial, 49½; Paris, five francs @ dollar; Mexican dollars, 83½.  
QUICKSILVER IN S. F., by the flask, 47 @ 50.

## METALS.

(WHOLESALE.)

THURSDAY M., September 20, 1877.

IRON.—			
American Pig, ton.	23 00	@ 22 00	
Scotch Pig, ton.	22 00	@ 23 00	
White Pig, ton.	23 00	@ —	
Oregon Pig, ton.	23 00	@ —	
Refined Bar.	31 @	61	
Horse Shoes, keg.	5 00	@ —	
Nail Rod.	—	@ 71	
Norway, Oval.	—	@ 71	
Tolled.	—	@ —	
CORRUGATED.			
Copper Thin.	37 @	40	
Sheeting, lb.	37 @	40	
Sheeting, Yellow.	21 @	22	
Sheeting, Old Yellow.	10 @	11	
Composition Nails.	—	@ —	
Composition Bolts.	24 @	—	
STEEL.—			
English Cast, lb.	14 @	5	
Anderson & Woods, ordinary sizes.	16 @	—	
Drill.	16 @	—	
Flat Bar.	15 @	18	
Flaw Steel.	84 @	123	
10x14 C. Charcoal.	8 50	@ 9 00	
Bacon Tin.	24 @	—	
Australian.	19 @	20	
ZINC.—			
By the Cask.	11 @	—	
Zinc Sheet 73 ft. 7 to 10, lb.	11 @	—	
73 ft. 11 to 14.	11 @	—	
81 ft. 8 to 10.	12 @	—	
81 ft. 11 to 10.	12 @	—	
NAILS.—			
Assorted sizes.	3 00	@ 25	
QUICKSILVER.—			
By the lb.	47 @	50	

## GENERAL MERCHANDISE.

(WHOLESALE.)

WEDNESDAY M., September 19, 1877.

RAGS.—			
Eng Standard Wheat, 1½ @	3 00	@ 3 25	
Neville & Co's.	—	@ —	
Hand Sewed, 22x35, 11 @	—	@ —	
24x36.	—	@ —	
Blackish Sewed, 35x10, 11 @	—	@ —	
Flour Sacks, halves.	8 @	11	
Quarters.	5 @	6	
Eighths.	4 @	4	
Heights, 60 inch.	8 @	15	
45 inch.	9 @	15	
40 inch.	8 @	15	
Wool Sacks.	3 lb.	42 @	
Hand Sewed, 42 @	—	@ —	
Machine Sewed.	42 @	—	
4 lb.	47 @	—	
Standard Gunnies.	15 @	16	
Bean Bags.	6 @	8	
CANNED GOODS.—			
Assorted Pie Fruits.	—	@ —	
2 lb. cans.	2 75	@ 3 00	
Table do.	3 75	@ 4 25	
Jams and Jellies.	4 25	@ —	
Fishies, 1½ gal.	3 @	50	
Sardines, 1½ lb.	65 @	90	
HI Boxes.	3 00	@ —	
Preserved Beef.	4 00	@ —	
2 lb. doz.	5 50	@ —	
do Beef, lb. doz.	5 50	@ —	
Preserved Mutton.	—	@ —	
2 lb. doz.	4 60	@ —	
Reef Tongue.	6 50	@ —	
Preserved Ham.	—	@ —	
2 lb. doz.	6 50	@ —	
Deviled Ham, 1 lb.	—	@ —	
do.	5 50	@ —	
do Ham, lb. doz.	5 50	@ —	
COAL.—			
Australian, ton.	9 00	@ 9 50	
Coos Bay.	7 00	@ —	
Bellingham Bay.	7 00	@ —	
Seattle.	7 00	@ —	
Cumberland.	14 00	@ —	
Min. Diable.	4 75	@ 5 75	
Lohib.	22 00	@ —	
Liverpool.	8 50	@ 9 00	
West Hartley.	9 00	@ 9 50	
Scotch.	8 25	@ 9 00	
Seranton.	13 00	@ 15 00	
Vancouver Id.	9 00	@ —	
Charcoal, sack.	75 @	—	
Coke, hbl.	60 @	—	
Sandwich Id. lb.	21 @	—	
do to cases.	6 @	6	
Eastern Coal.	7 @	8	
Salmon, hbl.	9 00	@ 10 00	
HI hbl.	4 75	@ 5 25	
2 lb. cans.	3 10	@ 3 20	
Pld Coal, hbl.	22 @	—	
HI hbl.	11 00	@ —	
Mackerel, No. 1.	—	@ 15 00	
HI Bbl.	14 00	@ 15 00	
In Kits.	3 00	@ 3 25	
Ex Mess.	3 50	@ 4 00	
Pld Herring, bx 3 @	3 00	@ 3 50	
Boston Smk'd Hg	40 @	60	
LEGS, ETC.			
Limo, Sta Cruz.	2 00	@ 2 25	
hbl.	—	@ —	
Cement, Rosen.	2 75	@ 3 50	
dale.	—	@ —	
Portland.	4 75	@ 5 60	
FISH.			
Sac to Dry Cod.	5 @	6	
do to cases.	6 @	6	
Eastern Cod.	7 @	8	
Salmon, hbl.	9 00	@ 10 00	
HI hbl.	4 75	@ 5 25	
2 lb. cans.	3 10	@ 3 20	
Pld Cod, hbl.	22 @	—	
HI hbl.	11 00	@ —	
Mackerel, No. 1.	—	@ 15 00	
HI Bbl.	14 00	@ 15 00	
In Kits.	3 00	@ 3 25	
Ex Mess.	3 50	@ 4 00	
Pld Herring, bx 3 @	3 00	@ 3 50	
Boston Smk'd Hg	40 @	60	
LEGS, ETC.			
Limo, Sta Cruz.	2 00	@ 2 25	
hbl.	—	@ —	
Cement, Rosen.	2 75	@ 3 50	
dale.	—	@ —	
Portland.	4 75	@ 5 60	

SPICES.			
Cloves, lb.	45 @	50	
Cassia.	22 @	25	
Green, lb.	6 @	7	
Pepper, lb.	15 @	17	
Pimento.	15 @	16	
Mustard, Cal.	1 50	@ —	
1 lb. glass.	1 50	@ —	
SUGAR, ETC.			
Cal. Cane, lb.	13 @	—	
Powdered.	13 @	—	
Fine crushed.	13 @	—	
Granulated.	12 @	—	
Golden.	10 @	10 1/2	
Hawaiian.	10 @	11	
Cal. Syrup, lbs.	70 @	—	
Hawaiian Molasses.	25 @	30	
TEA.			
Young Hyson.	35 @	50	
Moynie, etc.	35 @	50	
Country pked Gunpowder & Imperial.	50 @	60	
Hyson.	30 @	35	
Pow-choo O.	35 @	60	
Japan, 1st quality.	40 @	50	
2d quality.	25 @	35	

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## Mining and Other Companies.

Persons interested in incorporated shares will do well to recommend the publication of the official notices of their companies in this paper, as the cheapest appropriate medium for the same.

## California Fruit Growing Association.

Location of principal place of business, San Francisco, Cal. Location of property, El Dorado Co. Notice is hereby given that at a meeting of the Board of Directors, held on the fourth day of August, 1877, an assessment (No. 6) of \$3 per share was levied upon the capital stock of the corporation, payable immediately in U. S. gold coin to the Secretary, at the office of the company, 331 Sansome Street, San Francisco, Cal. Any stock upon which this assessment shall remain unpaid on the fourth day of September, 1877, will be delinquent, and advertised for sale at public auction, and unless payment is made before, will be sold on Monday, the first day of October, 1877, to pay the delinquent assessment, together with costs of advertising and expenses of sale. By order of the Board of Directors, HORACE JONES, Secy.

Office, 3



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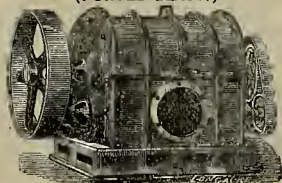
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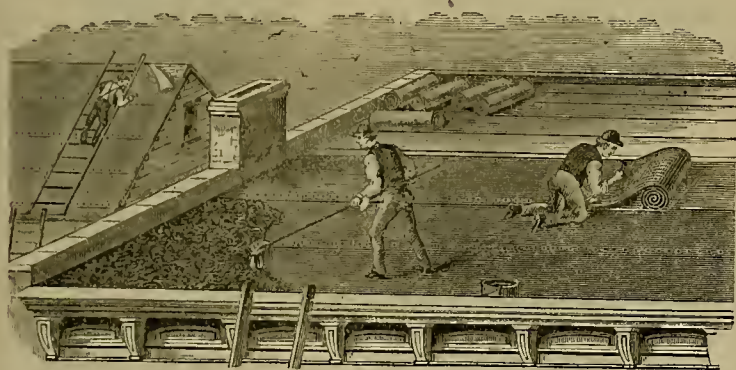
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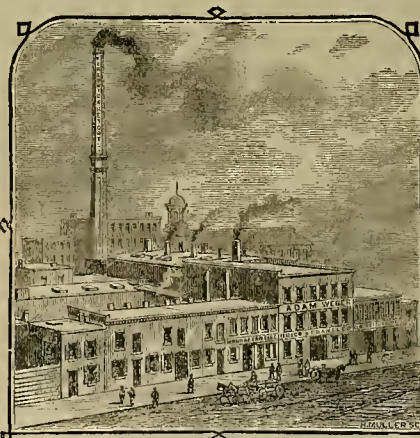
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# MINING AND SCIENTIFIC PRESS.

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BY DEWEY & CO.,  
Patent Solicitors.

SAN FRANCISCO, SATURDAY, SEPTEMBER 29, 1877.

VOLUME XXXV.  
Number 13.

## An Improved Cube Sugar Machine.

The old-fashioned method of making sugar in loaves and crushing it, is now almost entirely out of date and the manufacturers make it in small three-quarter-inch cubes ready for the market. A great deal of ingenuity has been shown by inventors in perfecting a machine to form the cubes expeditiously and in a satisfactorily exact manner, and large amounts of money have been expended in experimenting. The latest experiment in this line is the machine of Jasper & Boushey, recently patented through the MINING AND SCIENTIFIC PRESS Patent Agency. We visited the Bay Sugar Refinery, in this city, one day this week, to see the new machine in operation, and have prepared an engraving showing the details of operation.

The machine occupies a space of about four feet by nine. The sugar comes down from the centrifugal machine on the upper floor through the box, A. In this box is a roller, F, with pins, running at a speed of 1,800 to 2,000 revolutions, which, by centrifugal force, throws the damp sugar down on to an iron plate. These plates, G, are drawn underneath the box, A, one at a time, by means of the endless chain, d, which is operated by the eccentric cam, L, connecting rod, e, and the ratchet gear, b, c. As the plate, G, is drawn under the box, A, the sugar is pressed down by the centrifugal action of the roller, F. The plate, after being covered with sugar in this manner, is drawn along by the endless chain until it comes under the knife.

The cutting apparatus is a series of blades, O, forming squares, and is shown in detail in Fig. 2. These blades are operated by the bar, T, and the levers inside the frame, not shown in the engraving. Inside of each one of these squares is a presser or plunger, P, which fits closely to the sides of the square. As the knife or series of squares goes down these pressers, P, remain stationary until the knife, O, has performed its duties of cutting the soft sugar into cubes. Then the presser, P, comes down one-quarter of an inch with a pressure of 6,000 pounds, pressing the cubes out by the knife, O, to the perfect size of three-quarters of an inch. The action of the knife, O, is to cut the sugar into cube shape, and that of the presser, P, to force the cubes into uniform size, and also make them compact so they will not crumble. After the sugar is cut and pressed and the knife, O, draws back three-quarters of an inch, the presser, P, begins also to draw back, both knife and presser moving upward for a quarter of an inch. By this means the pressers not only impress the sugar into solid cubes after they are cut by the knife, but also act as plungers to keep the cubes on the plate as the knives are withdrawn.

The cutting knives, O, are operated by the levers (not shown in the engraving), which draw down the bar, T, to which the knives are connected by rods, x, z. The pressers, P, are operated by the lever, H, connected with the bar, S, and rods, r, r. The bed plate, M, is a heavy piece of iron which takes the pressure necessary in forming the cubes.

The iron plates, G, are piled up in front of the feed box, A, and are drawn under by the endless chain, as described, one at a time. As the plates pass under the knives and pressers four cuts are made on each plate, there being about 10 pounds of sugar on each plate. The plates then pass on to the endless belt, K, which is operated by the roller, J, by which they are carried to the drying room. As the plates pass

under the feed box, A, and receive the sugar, which is forced on them by the centrifugal motion of the revolving shaft and pins, F, the scraper, U, takes off the superfluous sugar. The details of this are shown in Fig. 3.

This scraper can be adjusted by set screws so as to get a certain amount of sugar on the plate according to the quality of sugar. Two small plows are fastened on the iron frame near the cutting knives, for scraping off the small, superfluous quantity of sugar left on the plates after the cubes are made. This waste is very small, amounting to no appreciable quantity.

address is P. O. box 1,350) have also devised a plan for a drying room, by means of which, in connection with this machine, cube sugar may be prepared for the market in three hours' time. This machine marks an important era in the manufacture of sugar.

The *Black Hills Pioneer* gives a list of 20 mills, carrying 195 stamps, now running in the Black hills, and names seven mills which will contain 125 stamps now in process of erection. These 320 stamps ought to reduce a good deal of rock if kept steadily running, though recent

## Notices of Recent Patents.

Among the patents recently obtained through Dewey & Co.'s SCIENTIFIC PRESS American and Foreign Patent Agency, the following are worthy of mention:

**CONCENTRATOR.**—Joseph S. Duncan, S. F. This is an improvement in concentrators, such as are employed to separate the valuable metalliferous particles and sulphurets from the refuse portions of ores. It consists of one or more vessels or chambers, of a peculiar shape, into which the pulp is introduced, and, as the heavier particles fall towards the bottom, they are met by a body of water which is given a rotating motion as it flows onward; and by its effect it causes the different grades in weight to settle into a series of receptacles extending down the sides of the vessel or vessels.

**STONE LATHE.**—Frank Keseler, S. F. Marble manufacturers employ what is known as a rubbing or polishing wheel or bed, for grinding and giving a uniform surface to such pieces of plain surfaced stone as can be held down upon it. This wheel or bed consists of a circular plate of cast-iron mounted horizontally upon a vertical shaft, and driven at a proper rate of speed, so that by pressing down upon the moving cast-iron surface of the bed or wheel, the surfaces of the stone will be ground evenly and uniformly. This invention consists in attaching to the frame of such rotary bed or wheel a lathe, by means of which the cast-iron grinding surface can be utilized for turning cylindrical forms, either true or conical.

**SOLDERING IRON.**—Thos. J. Walsh, S. F. This invention is an improvement on irons such as are used for soldering can tops, in which a circular ring of copper is employed to fit the rim to be soldered.

The difficulty in heating these irons without burning and spoiling the copper ring is very great, and is a serious annoyance. Mr. Walsh's invention consists in the employment of an interior solid cylinder of iron, which is connected with a rod and handle, so as to be movable longitudinally, and this cylinder is thrust forward so as to be heated by the fire without exposing the copper ring, and is withdrawn into the ring, to which it communicates its heat for use.

**BULLION SHIPMENTS.**—Since our last issue shipments of bullion from prominent mines have been as follows: California, Sept. 22d, \$201,342.38—total to date, \$667,122.28; Con. Virginia, Sept. 22d, \$141,477.38—total to date, \$440,657.78; Northern Belle, Sept. 20th, \$9,571.31; Northern Belle, Sept. 23d, \$10,575.13; Leopard, Sept. 25th, \$5,000. Following is an official statement of the bullion product for the last fiscal month of leading Comstock mines: Belcher, \$25,200; California, \$1,403,300; Chollar-Potosi, \$25,100; Con. Virginia, \$1,445,800; Justice, \$202,300; Ophir, \$7,900—total, \$3,109,600.

The tug *Wizard*, now lying at Pacific street wharf, has been almost completely rebuilt, at an expense of about \$20,000. She has been renewed from below the water line, with new decks and new timbers, and her engines, which have been built by the Risdon Iron Works, are of the compound pattern, one cylinder 26 inches in diameter and the other 44.

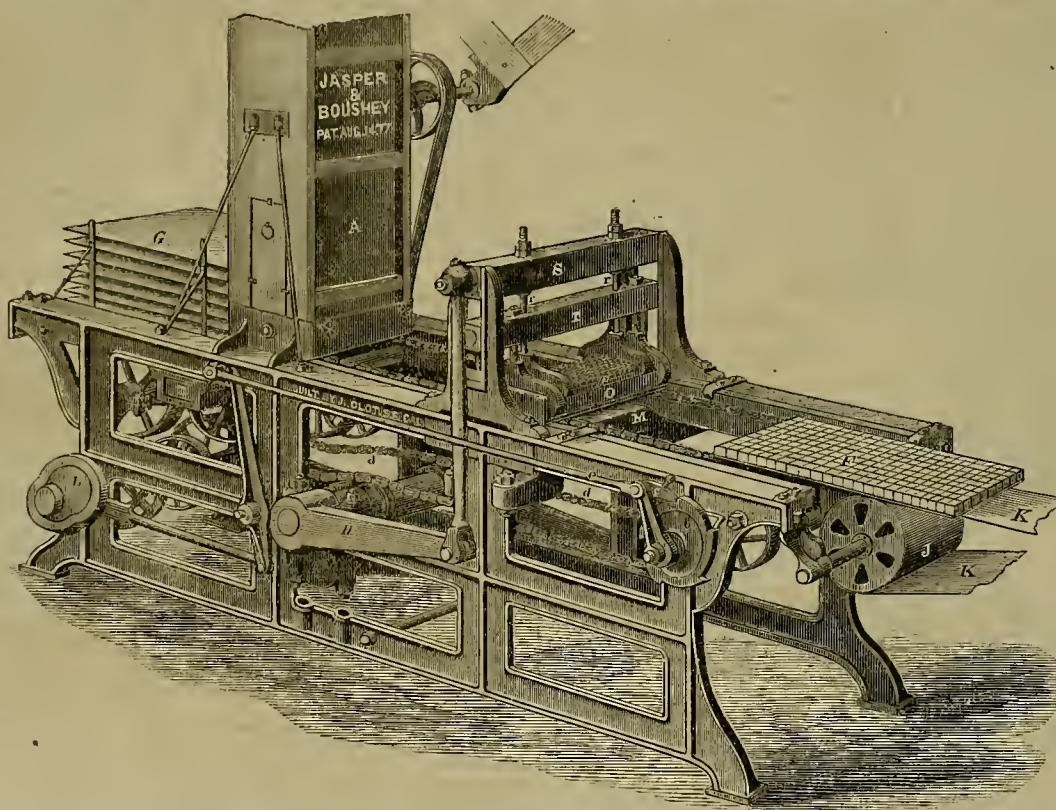


FIG. 1, JASPER & BOUSHEY'S IMPROVED MACHINE FOR MANUFACTURING CUBE SUGAR.

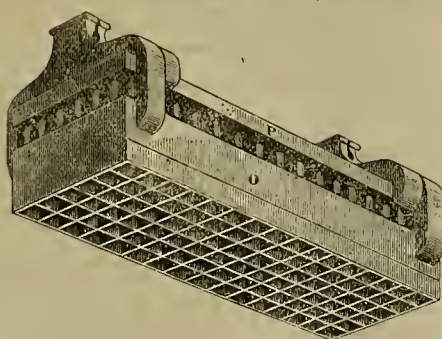


Fig. 2, Knife and Presser of Sugar Machine.

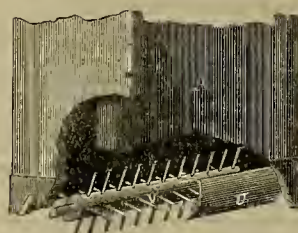


Fig. 3, Feeder and Scraper of Sugar Machine.

capacity of 60 pounds per minute. It requires one man to feed the sugar, one man to operate the machine and put the plates in position ready for passing through, and one man to take the plates, filled with sugar, from the belt and put them up in the drying room. The cubes are perfect in shape and the crystalline structure of the surface is plainly seen, which is not the case when the surface is sawed into cubes, as by some processes. The patentees (whose

arrivals from the Black hills state that some of the mills have not rock enough to keep them running more than half of the time. Black hills quartz mills are gold mills, simply provided with stamps, copper plates and blankets. Of course they are inexpensive affairs when compared with silver mills, with their appliances for working rebellious ores.

In consequence of a strike on the Great Southern and Western railroad in Ireland, the Postmaster General orders steamers from America to land only the Irish mails at Queenstown and take the others to Liverpool.



## CORRESPONDENCE.

It is the desire of the editors of this journal to be liberal toward all correspondents, and therefore statements and opinions are frequently published, on the authority of the writers, for which we do not assume responsibility.

### Notes from Colorado.—No. 2.

[By our Traveling Correspondent.]

EDITORS PRESS:—The Cornish tunnel, mining and reduction company is an organization of Boulder county, Colorado. The location of this tunnel is through Gold hill, about 10 miles west of the city of Boulder, entering the mountain a little above Left Hand creek, through the mountain 3,000 feet in length, to the southern slope of the same mountain; the line of the tunnel being about one mile east of Gold Hill village. Gold hill rises very precipitously from Left Hand creek, so that the first 2,000 feet of the tunnel would obtain a depth of nearly 1,000 feet.

This hill is also known to be a great network of veins, some of them very large and rich in gold and silver; some samples from some of them assaying over \$100,000 to the ton.

This mountain is located not far from the center of the wonderful telluride mineral belt of Boulder county, extending, so far as is known at present, from Magnolia mining camp on the south, to Ballarat mining camp on the north, a distance of 12 or 13 miles.

The tunnel of the Cornish tunnel company was started in 1872. It enters the mountain several hundred feet above Left Hand creek, at its base, but a depth of about 900 feet will be attained below the summit by continuing the tunnel through the hill. The size of the tunnel is five feet in width by seven feet in height. This tunnel has been run into the mountain between 950 and 1,000 feet, and, in respect to the character of the work done, will compare favorably with any other tunnel ever constructed. At the entrance of the tunnel a suitable building has been put up, in which is a blacksmith shop, engine room, lodging places for miners, etc. For ventilation, an engine with suitable pipes has been located, extending through the works. A substantial car track has been laid through the tunnel and into the drift of the Bonanza mine, and cars are running daily, taking out rock and ore. Six mining veins have already been cut by the tunnel, four of them being of large size and already developed somewhat by drifting upon them. All these mines belong to the tunnel company. The Relief mine was cut by the tunnel at about 212 feet from its mouth. The vein of this mine is about two feet in width, and a drift has been run upon it about 50 feet in length. A large body of ore has been found in this mine, principally iron pyrites, carrying gold, but not of high grade.

#### The Reliance Mine

Is cut by the tunnel about 400 feet from its entrance. The vein of the mine is about five feet in width, and a drift has been run upon it about 120 feet in length. The ore is also of low grade, being large part iron pyrites, carrying gold. Assays of the ore from the Relief and Reliance mines have shown gold and silver in the ore, from a few dollars to \$140 per ton.

#### The Bonanza Mine

Was cut by the tunnel at a distance of about 600 feet from its entrance, and has been drifted on about 300 feet. The vein of this mine is one of the largest, most even and compact veins to be found. Its average width is four feet, and it is well filled with ore assaying from a few dollars to \$250 per ton. The company owns 1,500 feet of each of the veins cut by the tunnel, etc.

At a distance of about 960 feet from the entrance of the tunnel, the "475" mine is crossed. At this point, where the tunnel crosses the mine, the vein is 16 feet wide. In this immense mass of gangue there are four or five streaks of rich telluride ore, varying in width from one to five inches.

In cutting the tunnel through this vein some very handsome specimens of tellurium and free gold were taken out, assaying from \$563 to \$10,000 per ton. In connection with this property the company have

#### Two Mill Sites,

For which Government patents have been obtained. On one of these sites, and immediately on the bank of Left Hand creek, stands the 20-stamp mill of the company. The power is furnished by a splendid 60-horse power steam engine. Water power from the creek can be had to drive the mill for at least eight months in the year.

The capital stock of the company is \$200,000—2,000 shares of \$100 each; 1,300 of these shares have been sold, and 700 are still reserved as a working capital. More than \$100,000 have been expended upon this property.

#### The "John Jay" Mine,

Belonging to Mr. A. I. Van Deren, is situated in Central mining district, Boulder county, Col., about three miles from Jamestown, four miles from Gold Hill, and 14 from Boulder City, where connections are made with all Eastern and Western railroads. The altitude of the

mine is 8,500 feet above the level of the sea. The height, however, does not impede the development of it, being situated on the southern mountain slope, exposed to the genial rays of the whole day. The climate is very mild, indeed, snow rarely staying on the ground more than a few days at a time.

Every facility that could be possibly offered for mining is here given in timber and water. The mountain pines and spruces are magnificent beyond description. For miles around the giant pines tower heavenward undisturbed by the axeman, until recently a saw mill has been erected in Providence camp, and about 200 yards east of the main shaft, on Jim creek. The water is abundant for all and every mining purpose. A large stream dashes along wildly at the mountain's base as pure as the sunlight and clear as crystal, affording a never-ending supply for all mining purposes. The scenery is wild and picturesque, romantic and sublime. Geologically the country rock is gneiss granite, in places taking the true form of granite; still at other points it is syenite. The strike of the vein is N. 30° E. with a dip to the N. W. at an angle of 80°. The lode is a strong, well-defined and true fissure, as is proven beyond the possibility of a doubt by the numerous shafts, prospect lodes and the depth of the main shaft (about 200 feet from surface). The ore of this mine is known as telluride ore, very rare and exceedingly rich in gold and silver. The discovery of this precious mineral in Boulder county has created an intense interest throughout the mining and scientific world, and to-day the mines of Boulder county stand very high in the estimation of all intelligent miners. Pieces of ore many pounds in weight are found in these mines that will assay \$150,000 per ton.

The development of the John Jay consists of one main shaft about 200 feet deep, one level 116 feet long; three other minor levels, 60, 45 and 33 feet long. From these excavations Mr. Van Deren has taken a large amount of valuable ore—enough to net him over \$50,000, besides defraying all the expenses of developing the mine, building a road to Gold Hill and one to Jimtown, the latter at a heavy expense. And it is estimated that there is ore in sight to the value of \$150,000.

The notes from which these statements in regard to the John Jay mine are given, were furnished to me by Mr. W. M. Rule, Mr. Van Deren's foreman, at his request.

To Col. John A. Ellet, of Boulder City, Superintendent of the Cornish tunnel, I am indebted for the information embraced in my notes regarding the progress of their tunnel mine at Gold Hill. G. W. M.

### Matamoras Company.

The Matamoras company have reason to be well satisfied with their season's work. Besides developing as fine a body of ore as was ever found in Prospect mountain, they have in their short run at the furnace produced over 130 tons of bullion, valued at \$50,000. This, from the small furnace used by the company, is a remarkable result, and Messrs. Sturgis & Steel are to be congratulated on their success. The company have under way and will commence shortly many important improvements. The little Butteport smelter is about to be replaced by a large furnace, capable of reducing 50 tons of ore per day. The site has already been graded, and Foreman Atkinson informs us that it will be completed by the 10th of October. Mr. Steel has gone East, and during his absence will purchase hoisting works, materials for a tramway, and other articles necessary. Timbers for the main shaft are being sent to the mine daily, and this will be at once pushed forward. It will contain two compartments, and will be furnished with a safety cage and other improvements of the latest and best invention. The body of ore recently encountered in the mine is proving to be a splendid deposit, of as yet unknown extent. Its proportions are, however, sufficient to justify the necessary outlay incurred by the company in putting everything in first-class shape, and adds one more to the list of good mines in the district. *Eureka Sentinel.*

#### NEW SPOUT FOR THE CALIFORNIA MILL.—

To-day a new spout will be put in for conveying the pulp from the California battery to the pan mill. This has to be done about once a year. The grit is so sharp that it cuts away the fibers of the wood at the rate of two inches yearly. The last spout put in had a three-inch bottom. This has been worn away by the pulp till the nails which held it together are entirely cut off and gone. It has been found, of late, necessary to wedge it up from the outside to hold it together. Everything is worn away as by the grit of a grindstone. The wear of the pulp is curiously manifested where knots occur in the planks composing the spout. These knots wear slower, of course, than the other portions of the timber, being harder. After the flow begins to rise over these knots the plank on each side is rapidly cut out, so that the first thing known, unless carefully watched, there is a hole. The plan now adopted is to build a double flume, one within the other, and when the inner one is worn out to yank it out and put a new one in its place. Everything is now ready for this kind of a change, which will be made to-day. The delay in operations at the mill will be from three to four hours only. This stop will be seized upon to put in a new piston at the pan mill. *Enterprise.*

### Copper in Arizona.

The Arizona Citizen says: Arizona, without doubt, has the largest and richest deposits of copper in the United States. There is much copper near the Colorado river, on Bill Williams' fork; some 40 miles west of Tucson there is a mountain or more of it; it is abundant in Globe district; but, perhaps, the largest and richest deposit in America is at Clifton. With rail transportation as near as San Simon valley, 100,000 pounds of pig copper daily are promised by two companies alone, and enough smelting has been done to warrant that the promise will be fulfilled. Railway men are asked to note this one item from but one of many localities in Arizona. In this connection we copy the following from the Grant county Herald, of August 25th:

I. N. Cohen & Co. shipped to-day, by Maxwell's train, 55,000 pounds pig copper, via El Moro to Baltimore, and have still in store 47,240 pounds. This proof is as strong as holy writ that Lesinsky's Longfellow mine is panning out.

Sweeney & Gleason's furnace, also at Clifton, has lately been fired, and there is no reason why it should not duplicate the daily yield of the Lesinsky furnace. The ores of both companies are smelted in the Bennett furnaces. None other have been found to stand the test.

At Clifton there are 80 recorded mines, all of which are regarded as exceedingly valuable, and the lack of fuel is all that prevents the ores from being worked. The completion of the Texas Pacific or the California Southern Pacific to a point convenient for the shipment of ores or transmission of fuel to the furnaces, will work such a change in favor of the production of copper as to heggar the belief of the most sanguine. The Longfellow and Thompson are the only mines worked at present, and the companies working them only run one 30-inch furnace each; and, notwithstanding the limited capacity, they will turn out 3,000,000 pounds pig copper annually.

When rail transportation can be had to a point as near the mines as the San Simon, Mr. H. Lesinsky assures us that the yield will be not less than 100,000 pounds pig copper daily from the works of these two companies, which is not a tithe of what will be produced by other companies which will then enter into the business of producing copper ingots.

The Clifton ores are infinitely richer than those of Lake Superior, which will not be denied when their relative values are known. The Clifton ores are entirely free from base metals; no antimony or arsenic are contained in them, and, as a consequence, the copper brings a higher price in copper markets than any other offered for sale. The Clifton ores average from 20 to 30 per cent. copper, while those of Lake Superior will not go above 10 per cent., if as high; and yet the Superior deposits are the brag mines of the country, and perhaps justly so, for the reason that other Eastern competitive mines only give from five to six per cent. But now the Superior deposits must dwarf in public estimation, both as regards quality and quantity of ore, for the reason that the value of Clifton ores are becoming better known. In our last reference to this subject, we stated that rail transportation would induce H. Lesinsky to work 1,000 men in his mines, which he can do with profit to himself and employees, if freight of fuel and copper were cheapened; and what Mr. L. can and will do, others there, owning mines, would find it to their interest to do also; and with this knowledge of the prospective industries of Clifton and other mining regions (and they are not a few), we impatiently wait the whistle of the locomotive.

Shipping north, via El Moro, ceases after the last of September, for the reason that owners of trains do not choose to risk the pinching cold that is encountered in that hyperborean region after the middle of October; and, consequently, copper accumulates at the works from that date until March, unless an outlet can be found for it by the Southern route, through Texas.

MINER PREACHERS.—Theologians and gentlemen devoted to the ministry generally find their duties of so brain-racking and arduous a nature as to totally incapacitate them from manual labor. The week days are devoted to the preparation of elaborate discourses, and the Sabbath to the delivery of the same. Ruby Hill, however, furnishes two examples of a directly opposite nature. Rev. Mr. Wm. Johns and Cox are both as good miners as ever wielded a pick in a drift, or let off a blast, and can be found taking their regular shifts, and earning their \$4 per diem, on all occasions. When Sunday rolls around they in turn fill the pulpit at Miners' Union hall, and preach the "Word" to a congregation of stalwart miners, who through the building at that time. They are both eloquent and educated men, and their pulpit oratory is above the average. They serve their Master without reward, and scatter their seed in good ground. The restraining influences exercised by them can be best appreciated by stating the fact that a more orderly or intelligent community cannot be found on the coast than the inhabitants of the little village on Ruby hill. *Eureka Sentinel.*

THE miners of Pennsylvania, Michigan and Wisconsin are said to be organizing a new secret order, called the "Iron Hearts." The oath binds the members to obey all orders at the peril of life, to defend the interests of the order, never to reveal its secrets and to succor brother members.

### Colorado Mines.

A correspondent of the Denver Tribune, writing from Rabbit-ear range, Grand county, Col., says: Nearly all the more prominent mines here are being worked by small forces of men on each. Mr. Bower is running a drift on the Wolverine lode; has now about 10 inches of good pay in sight, which is widening with depth. The character of the mineral in this drift is chloride of silver, which is nearly 50% pure silver. There is also with this through the quartz native and ruby silver found very frequently. The Wolverine will, in all probability, go into the hands of California men this fall. If so, it will be worked vigorously all winter. The Crown Point lode, the boss lead lode of the Rockies, will, perhaps, be taken in hand by the same parties.

Stokes & Johnson have about completed their work for this year on the Forst Juan. This is a recent discovery and promising lode, and shows a strong vein of almost solid mineral five feet wide. A 50-foot drift crosses this lode at a depth of 30 feet. This is intended only as a discovery "hole." The lode will be further developed with a tunnel lower down the mountain. L. J. Pollard is preparing to work his Ruby lode the coming winter. He is putting up a house near the mine, also a blacksmith shop. Len proposes to take out some very fine ore this winter, unless, driven to despair by the too-frequent visits of Mr. Bruin, he is compelled to take the field in defense of his home and fireside. In this case he will very likely take out a few grizzly bear skins instead of ruby silver.

Clauston & Porter will work their lode, the Silver Glance, this winter. They are getting out their timber supplies, etc., so as to begin business in earnest.

Isaac Burton is tunneling on the Hilberton lode, and will continue to work it all winter. This is undoubtedly one of the best mines yet discovered here, and it is only partially developed.

The Grand Lake lode and numerous others will be worked some this winter. A good many of the prospectors up in this section, owing to the hard times, have been obliged to abandon a number of their discoveries, which will all prove valuable to some one in the future. If we had mills here we would feel that we were as independent as any of our neighbor mining camps. But in this respect we are pretty badly left.

### Explosion of Gas in an Amalgamating Pan.

The Gold Hill News, speaking of an accident at the Petaluma mill, says: The manner of the accident was as follows: When the amalgamating pans are started up after they have been cleaned the action of the heat and mercury upon the pulp rapidly generates a gas, which explodes as readily as gunpowder upon coming in contact with fire. Every amalgamator is well acquainted with this fact, and they always take every precaution to prevent an explosion from this source. Mr. Brown, who was an old and experienced workman about quartz mills, knew this well enough, but this morning he seemed to have neglected or forgotten the fact. He raised the small lid in the top of the pan to examine the condition of the pulp, when the gas rushed out through the opening. It was ignited by the fire from the candle which Brown held in his hand, resulting in a tremendous explosion, the report of which sounded like the firing of a cannon. Brown was knocked senseless by the concussion, and received several body wounds, the exact extent of which could not be learned by the News reporter, who visited the mill this morning. His face was badly burned by the flaming gas. It is feared that his sight was totally destroyed. A team was obtained from Mr. Emmet, of Gold Hill foundry, and the injured man removed immediately to his room on A street, Virginia City.

Mr. Brown is a single man, and has no one dependent upon him for support. He had formerly worked in the Sacramento mill, north of Virginia, and had been employed in the Petaluma mill since the first of the month, and had proved himself a skilled and competent workman.

The accident need not have occurred if the lid had been left open a few minutes so as to allow the gas to escape. This is generally done, or else the light is kept at safe distance. The disaster can be attributed to nothing but Brown's absent-mindedness and carelessness. Fortunately none of the other workmen of the mill were near enough to the pan at the time to in any way feel the effects of the shock, or to come in the way of the flying fragments of the iron castings. The top of the pan was blown off, but there was no other damage done to the mill.

ARCHING TUNNELS.—The water company has a large force busily employed repairing and strengthening the canal in anticipation of winter. Prominent among the various improvements being made is the provision for the protection of the tunnels on the line of the ditch. The tunnel through Cape Horn ridge, as well as the one that perforates the mountain nearly opposite the Flume house, is being arched with solid masonry. The cost will be considerable, but the work will be permanent when completed, and be the cheapest in the long run. No other canal in the State is in better repair or more carefully looked after than that of the Mokelumne Hill Water Company. *Calaveras Chronicle.*



## MECHANICAL PROGRESS.

## Testing the Strength of Metals.

According to the *American Manufacturer*, we are to have something new in the way of a testing machine. We read that Mr. John L. Gill, Jr., of Pittsburgh, has been engaged for some months in the construction of a new and powerful machine for testing metals, at his car-wheel works. Having given great attention both to the chemical analyses and mechanical tests of metals for some years, he has qualifications and opportunities of knowing just what is required in practice. The capacity of the machine is 100,000 pounds. We give as follows his own reasons for building his machine, which will be appreciated by all scientific persons: "During the course of the experiments I met with an unexpected obstacle. I found the testing machine could not be made to give the correct value of the tensile strength, in consequence of its inability to pull the specimen in a direct line of its axis. In testing cast-iron, the specimens were subjected to a bending as well as tensile stress, which caused them to yield partly by tearing, thereby giving variable and unreliable results. I have therefore been compelled to consider all my past experiments on tensile strength of cast iron as worthless. On investigation, it appeared that the defect above mentioned was common, to a greater or less extent, to all testing machines in use. To remedy the defect, I found it necessary to design and build a new testing machine, involving a principle never before tried, which should insure that the line of stress should be an absolutely direct straight line, coincident with the axis of the specimen." We hope to report more particularly upon the machine at work in a few weeks.

**PERFECT IMITATION OF GRAIN OF WOOD.**—There is a paper carpet made in England by Mr. Gloyne, which is designed to imitate parquet flooring; the paper being printed in patterns to imitate different woods from photographs, so that the *reproduction* is absolutely perfect. The floor is prepared by being made perfectly level, and the crevices filled up with plaster of Paris. Over this hessian is stretched, and on this first lining paper, and then the patterned paper is pasted, the whole being finished with a coating of a peculiar varnish, wonderfully hard and wear-resisting. This carpeting, of course, can be kept perfectly clean with the greatest ease; and though the wear of paper carpet may be thought problematical, Mr. Gloyne testifies that he has had rooms carpeted with it for 16 months without showing appreciable signs of wear. There is a wide field of utility open to the use of the photographic grained paper in many ways, for it is the most remarkable imitation of ornamental woods ever produced.

**DOUBLE SCREW.**—At a recent English exhibition, a novel form of arrangement of the dual engine was shown by Mr. Somerset Mackenzie. Great increase of power is obtained in screw-propellers by using two screws rotating in opposite directions, one taking the water of the other. By the use of a hollow shaft and double engines this can very easily be accomplished, but Mr. Mackenzie has discovered how to do it with one cylinder—that is, he gets two reverse rotating motions from the action of one cylinder and piston. How this is managed it is not very easy to explain without the aid of diagrams, but we may state that while one shaft is driven by an ordinary crank the other is driven by a kind of slotted crank, with its head passing round the other shaft as it rotates. This is the arrangement in the vertical engine; that of the horizontal, which is about to be put in a boat recently constructed, is somewhat modified, but the same in principle.

**LOCKING MINERS' LAMPS.**—A very simple and at the same time effective method of locking miners' lamps has been adopted at the Atherton collieries, near Manchester, England. The ordinary locks and keys, which are so easily tampered with, are entirely discarded, and a soft metal bolt supplies their place. Before the lamps are given out from the office each top is secured down by one of these bolts, which, after being pushed through a slot, is flattened and stamped at both ends by means of a machine constructed for the purpose. Once fastened in this manner the lamp cannot be opened without destroying the bolt, which is only extracted when the lamp is again brought up from the mine, and the impressed stamp at either end effectually prevents any other than the one issued from the office being placed in its stead.

**NOTE ON PHOSPHOR BRONZE.**—We read in a report of the English Polytechnic Society's fair, that the Phosphor Bronze Company obtained a first silver medal for a large collection of exhibits illustrating the various uses to which this invaluable alloy can be and is put. Our readers are aware that phosphor bronze is a compound of tin, copper and phosphorus in certain proportions, according to the special work required. Among the exhibits were several hearings that had been in constant use for long periods without appreciable injury, and a plunger that had been in operation 572 days without giving any evidence that it had been in work at all. Few better illustrations of the wear-resisting properties of phosphor bronze could have been afforded.

## WASTE AT SAFETY VALVE AND WHISTLE.

A writer calls the attention of the *Railroad Gazette* to the amount of steam which may be wasted at the safety valve and the whistle of a locomotive. If it requires from 100 to 120 pounds pressure to the inch to enable an engine to perform its daily task, and the safety valve is set to blow off at 130 pounds, it would seem that this ought to give the engineer and fireman ample latitude to so enable them to adjust the ash-pan dampers and door of the furnace that steam would rarely escape at the safety valve. As to the whistle, a simple toot or two, in cases of emergency, to warn some one from the track, or as a signal for the brakes, would seem to be the only legitimate use of steam in the way of whistles. And yet of the 20 or more trains which daily pass my residence, I notice that nearly half of them make a regular practice of blowing their whistles some 20 rods at a time and some half-dozen times within as many miles, and their safety valves also seem to be at work much of the time. It would be interesting to know exactly what per cent. of the fuel is wasted in this way. If the coal hanks upon their tenders were so made as to let a bushel of coal drop upon the track every 10 miles of their progress, the waste would then become so manifest, no doubt, that it would be attended to at once. If one train can be run without the use of the safety valve or whistle, another one can be so run, with the exercise of an equal care and vigilance on the part of the engineer and fireman. This matter of waste at the safety valve and whistle seems to rest entirely with the men upon the foot-board of the engine, and as they prize their good standing as engineers and firemen, they should attend to it.

**WARNING THE PISTON.**—The use of the steam-jacket in connection with the cylinders of steam-engines and the advantages attendant thereupon are well known, but the diagrams taken by the dynamometer show that a large amount of condensation still takes place; a portion of the condensed steam in the cylinder is evaporated anew during the expansion and another very important portion is also evaporated; but by taking the heat from the surrounding parts of the engine, thus causing a rapid cooling of such parts, those parts which are immediately surrounded by the steam-jacket are instantly reheated; but those parts which are not so surrounded, such, for instance, as the piston and rod, are relatively cold on the arrival of the steam in the cylinder, and they therefore condense a large portion of it before they arrive at the same temperature as the steam which flows in. The object of the invention of Madam Veuve Andre, of Thann, Alsatia, is to avoid this latter condensation, such object being attained by forming the piston and piston rod hollow, the spaces in the two parts being made to communicate with each other. Steam is introduced into the piston and rod through a pipe which is attached to the piston and passes through a stuffing-box in the end of the cylinder. This pipe slides in a steam-supply pipe, which is provided with a stuffing-box, and has an inlet for the admission of steam and an outlet for the condensed steam. The outlet may communicate with a pump to draw off the condensed steam.

**CARDING BUTTONS.**—Charles Kellogg, an ingenious mechanic and inventor of North Amherst, has for the last year been engaged in building a machine for fastening buttons on to cards, a process heretofore done by hand with a needle and thread, a day's work being about 40 gross for a smart workman. The machine is calculated to fasten one gross per minute on cards containing two dozen each, or 60 gross per hour. It is about two feet long and 15 inches wide, and as many high, and fastens the buttons to cards with fine wire. Four buttons are fastened or wired at a time; the card moves along and four more are wired, and so on until the required number are on the card, when another card is pushed along from the top of a pile of 200 or more on the machine. One girl can attend to each machine. This machine, besides the model for the patent office, costs \$1,600, though the duplicates can probably be made for \$300.

**USE OF THE TELEPHONE.**—During a recent visit to Cleveland, says the *American Manufacturer*, we found the telephone in use in a number of offices, and conversation being carried on between them and their manufactories at distances varying from one to seven miles, this, too, in an ordinary voice, with no particular effort except for distinct pronunciation. The Cleveland Paper Company has fairly domesticated this new discovery in their offices in connection with their different mills. It is also in use by the Standard Oil Company, Union Iron Works, Cleveland Transfer Company, Cleveland Iron Company, Leader Printing Company, Rhodes & Co. and other firms, while orders are being filled as fast as it is found convenient to do the work.

**SAW-SET FOR RIBBON SAWS.**—The Chemnitz tool factory, Chemnitz, Saxony, makes a mechanical saw-setter which acts as follows: On turning a hand-wheel motion is given to two levers, standing opposite each other and perpendicular to the saw, the steel point of one lever taking a tooth on the right side of the saw and the point of the second lever a tooth immediately in advance of the other, to the left. These two levers being lifted off, a third, acting parallel to the length of the saw, takes it a couple of teeth further on. This action is repeated on each revolution of the wheel and results in a very uniform setting of the teeth of the saw.

## SCIENTIFIC PROGRESS.

## A Mountain Dismembered.

An interesting account of the recent falling of a mountain in Tarentaise, Savoy, causing disaster to two flourishing villages, has been communicated to the *Courrier des Alpes*, by M. Berard. The phenomenon has been incorrectly reported as instantaneous and the destructive effect complete; whereas the case is that of a mountain, which, for 20 days without cessation, has been dismembering itself, and literally falling night and day into the valley below, filling it with piled-up blocks and stones, extinguishing all sounds by its incessant thunder, and covering the distant horizon with a thick cloud of yellowish dust. The entire mass comprised in the slope forms a mutilated cone 200 meters broad at the top, and 600 at the base (the slope being about 50°). This is composed of blocks of hard schist, lying close together, but no longer united; and it is united to the body of the mountain only by a vertical mass 40 to 50 meters thick, which already is fissured and shaken. Periods of repose occur, lasting only a few seconds or a minute at most; then the movement recommences, and continues about 500 hours. Blocks of 40 cubic meters become displaced with no apparent cause, traverse the 1,800 meters of descent in 30 seconds, leaping 400 or 500 meters at a time, and finally get dashed to pieces in the bed of the torrent or launch their shattered fragments into the opposite forest, mowing down gigantic pines as if they were so many thistles. One such block was seen to strike a fine fir tree before reaching the bridge between the villages. The tree was not simply broken or overthrown, but was crushed to dust (*volatilise*). Trunk and branches disappeared in the air like a burning match. Rocks are hurled together and broken into fragments, that are thrown across the valley like swallows in a whirlwind. Then follow showers of smaller fragments, and one hears the whistling sound of thousands of pebbles as they pass. M. Berard reached the edge of the rock (2,460 meters high) on one of the sides of the falling cone and ventured along it, obtaining a good view of the "terrifying" spectacle. He reaffirms his conviction that the phenomenon is inexplicable by any of the usual reasons that account for Alpine disturbances—such as penetration of water, or melting of snows, or inferior strata in motion; nor does the declivity of the slope explain it. His hypothesis is that some geological force is at work, of which the complex resultant acts obliquely to the axis of the mountain, and almost parallel to its sides.

## Test for Flour Adulterations.

From the *London Corn Trade Journal* we learn that Dr. Hinly, professor of chemistry at the University of Kiel, has suggested a method by means of which any person of ordinary intelligence may test the amount of adulteration of flour. It is based upon the fact that chloroform is specifically lighter than nearly all the substances usually employed for these adulterations, such as lime, chalk barytes, plaster, marble, bone-powder, etc., while the genuine flour is again lighter than chloroform, in which none of the above-named substances are soluble. The testing process is simple, and all the apparatus required is a small test tube about three-eighths of an inch in diameter and four or five inches long. A teaspoonful of the flour to be tested is placed in the test glass and chloroform poured on to fill the vessel to about three-quarters of its length, when it is well shaken, and then placed in an upright position, so as to remain undisturbed until the various substances mixed together have had time to find the level assigned them by their specific gravity, the flour swimming near the surface at the top of the vessel, while the mineral bodies will sink to the bottom. It should be observed that undiluted flour often shows a slight filmy deposit of a greyish or brownish color, which it must be supposed is stone-dust produced in grinding. A white deposit, however, will invariably indicate an adulteration with one or another of the substances mentioned above. If the materials are weighed before and after separation, the amount or degree of adulteration may be pretty accurately ascertained.

**MERCURY IN JAPAN.**—According to Mr. Plunkett, cinnabar occurs in two localities in Japan, but neither of these deposits are now worked. One mine in the northern part of Nippon is said to be very promising, but the present proprietors are not now inclined to expend money for its development. The other mine is near Ainoura, on the peninsula of Hirado, in Matsura kori of Nagasaki ken. Mr. Gower, who formerly superintended the working of this deposit, reports it to be valuable. The mine was opened under his direction some years ago, and a retort furnace was erected for the distillation of the metal from the ore. The furnace was worked successfully, and mercury was produced in some quantity. During the absence of Mr. Gower, however, the workmen by careless firing, melted the iron retorts, and, discouraged by this accident, the owners decided to abandon the undertaking. The cinnabar occurs here as a local impregnation in sandstones of the coal-measures, and filling small seams and fissures in the rock.

## Permeability of Walls.

Experiments by Profs. Marker and Schultze show that under some circumstances the passage of air and gases through walls and brick work is by no means difficult. All that is necessary to promote the passage is a difference of temperature of 10° between the inside and outside air. The figures given are as follows, per hour, for each square yard of wall surface: Through sandstone, 3.7 cubic feet; through quarried limestone, 6.5; through brick, 7.9; through turfy limestone, 10.1. This fact of the penetration and flow of gases through stone has one important bearing on the construction of wholesome residences. Most people are under the impression that if a cellar is lined with Portland cement, the dampness and malaria of the earth beneath will be shut off. If not in some way prevented, earth vapors pass upward into the building, and that part of the process is usually hastened in the winter months by a furnace in the cellar. Doubtless many malarial diseases, such as typhoid fever and diphtheria, may thus be propagated in cities, especially where the building sites are imperfectly drained or are "made ground." The experiments referred to are an additional proof that a Portland cement lining will not cut off the malarious gases, as indeed might also be inferred from its porous character. The only effective barrier against foul air and dampness must be some substance which is not permeable. Probably this result might be attained by means of a layer of asphalt or bitumen, if it were evenly spread, and weighted so as to keep in place. In view of the estimate that half the diseases of mankind are preventable, it is not too much to hope that modern sanitary improvements may largely reduce the death rate in cities; with many residences the improvement needs to begin at the bottom.

**AN INSTITUTION PROPOSED.**—The address of Prof. E. C. Pickering, as Vice-President of the American Association, was read by proxy, as he did not attend the Nashville meeting. The address, says the *Iron Age*, was an argument in favor of the endowment of scientific research. Its most interesting portion was the description of a suitable building and arrangements for a physical laboratory, where experiments might be made to carry out scientific researches. Prof. Pickering gave elaborate details of his project, and pointed out the numerous advantages that might be expected to result when these facilities were afforded to investigators. The plan includes the appointment of a presiding officer and a staff of assistants. The "castle in Spain" of Prof. Pickering is not a thing of beauty. He says: "The building itself is large but low, and resembles one or more blocks of two-story dwelling houses. No more common mistake is made than in wasting the money which should be used for equipment on architectural effect. It is useless to hope for architectural heauty in this building."

**MEANS OF PRESERVING MILK.**—At a recent meeting of the American Dairymen's Association, Prof. Caldwell, of Cornell University, read a paper entitled "Boric Acid and other Substances for Preserving Milk." Prof. Caldwell spoke of various substances for this purpose. He had tested various antiseptics for the preservation of milk, and found that boric acid was better than anything he had tried. When milk soured in from 20 to 24 hours, at a temperature of 80° Fahr. and upward, one part of boric acid added to 500 parts milk caused it to remain sweet for 50 hours. At a temperature of from 72° to 79°, one part of boric acid to 1,000 parts of milk, by weight, kept it sweet 50 hours. He applied it to milk warm from the cow, and thus preserved it twice as long as it would keep without it. No injury to the quality of the milk occurs in using one part of boric acid to 1,000 parts of milk. He stated that it was not a poisonous substance; he had taken the milk thus preserved into his own stomach and experienced no harm therefrom. One pound of boric acid to 1,000 pounds of milk will keep it sweet twice as long as it would keep without it.

**METALLURGICAL REVIEW.**—We have received the first issue of a new publication, the *Metallurgical Review*, by David Williams, 83 Read street, New York. It is of fine appearance and well filled. The *Review* is intended to be a record of current progress, which shall combine the enterprise of a newspaper with the convenience and permanent value of a book. It will contain original contributions from writers of known ability and recognized scientific standing, American and foreign. Its field includes whatever is new and important relating to the metallurgy of the useful metals, from the mining of ores to the final processes which make the metals available as materials in the arts.

**NEW BIRD.**—Prof. O. C. Marsh announces a new genus and species of toothed bird, which he calls *Baptornis advenus*. He also describes a new fossil lizard, by far exceeding in magnitude any land animal hitherto discovered, which must have been fully 50 to 60 feet long. It was probably a herbivorous reptile. It comes from a bed on the eastern flank of the Rocky mountains.



WEDNESDAY, A. M., SEPT. 26,	600 Monumental.....	20c
40 Alpha.....	144(4)@.14	20c
245 Belcher.....	61	20c
155 Best & Belcher.....	20	20c
220 Bullion.....	84@.84	20c
170 Bullion.....	20	20c
500 Boyle.....	25@.30	20c
50 Caledonia.....	3.95	20c
315 California.....	304@.30	20c
100 Consolidated.....	10	20c
10 Confidence.....	5	20c
185 Con Virginia.....	33@.33	20c
100 Crown Point.....	44@.40	20c
5 Chollar.....	35	20c
100 Davidson.....	10	20c
400 Davidson.....	53@.55	20c
430 Exchequer.....	8	20c
340 Gould & Curry.....	9@.90	20c
100 Hercules.....	20	20c
65 Hale & Nor.....	71@.70	20c
270 Julia.....	2.85@2.90	20c
100 Justice.....	17@.17	20c
30 Leviathan.....	20	20c
100 Mexican.....	10	20c
600 Monumental.....	20c	20c
500 Northern Nev.....	24	20c
100 New York.....	24@.24	20c
125 Obispo.....	161@.17	20c
5 Overman.....	24	20c
170 Savage.....	61@.61	20c
170 Sargent.....	20	20c
150 Silver Hill.....	4.65@4.70	20c
903 Succor.....	21@.20	20c
1000 Teller.....	95c	20c
600 Wells.....	45@.45	20c
600 Wells-Fargo.....	45@.45	20c
160 Yellow Jacket.....	10c@.10	20c
AFTERNOON SESSION.		
100 Alpha.....	12@.12	20c
270 Belcher.....	30	20c
10 Best & Belcher.....	20	20c
210 Crown Point.....	4.70@4.75	20c
300 Con Intercontinental.....	11@.11	20c
300 Coast R.....	11@.12	20c
300 Con Washoe.....	60c	20c
100 Consolidation.....	15c	20c
300 Endowment.....	10	20c
70 Exchequer.....	8	20c



# MINING SUMMARY.

The following is mostly condensed from journals published at the interior, in proximity to the mines mentioned.

## California.

### AMADOR.

**ECUPE.**—Amador Ledger, Sept. 22: The hoisting works of this mine are fast approaching completion. It is the intention to work by steam power, and, if everything goes along satisfactorily, the works will be started in three weeks. The Eclipse joins the Keystone. In fact, one of the tunnels of the Keystone has passed over the boundary and explored the Eclipse ground to a distance of 130 feet, showing a good-sized ledge of excellent rock. This is at the 300-ft level. The shaft of the Eclipse is down at present 120 feet. It is contemplated by the managers to sink 130 feet more, to the 300-ft level, where good rock is known to exist. Sufficient rock has been sold to enable work to be prosecuted for some time.

**CROWN POINT.**—The last clean-up at the Crown Point mill, at Drytown, averaged 70 per cent. This is better than any previous run, and leaves a handsome margin of profit. The mill is shut down in consequence of the failure of water.

**MILLS RUNNING.**—There are only four mills running at the present time in the county, namely, the Keystone, Amador Con., Onella and Tallman. The water in the Amador canal is not sufficient to run more. There are only about 500 inches flowing through the ditch.

**CENTENAL.**—This is a very promising location on Dry creek, between the Gover mine and Plymouth. At the depth of 70 feet from the surface a ledge eight feet wide was met with, which prospected exceedingly well, making the hopes of the owners to the highest pitch. It was thought advisable to continue sinking, not exactly following the course of the ledge. The shaft reached a depth of 150 feet, and the men are now drifting to strike the ledge at that depth.

### BUTTE.

**RIVER MINING.**—Oroville Mercury, Sept. 22: A. Nelson and H. Wallis have put a wagon on the river, about five miles above town, and have got the bed completely dry. They are now engaged in washing up the river bed. They find some eight or nine feet of gravel before reaching the bedrock, but it all pays well to run through the flume. They will make a good stake if the river does not rise this month. At one place on the bedrock they got a small flow, much more of such earth remains is a question that interests them very much. We hope to hear that they have found it in large quantities.

### CALAVERAS.

**RICH STRIKE.**—At Mokito.—Calaveras Chronicle, Sept. 22: Mokito gulch takes precedence of all other mining camps on the Pacific coast for frequency and richness of "strikes" in quartz. Scarcely a week passes without some new discovery being made, and the camp is to-day really one of the liveliest in the middle or southern mines. We are pleased to learn of a rich strike lately, in the well-known Monte Cristo, owned by Messrs. Longley & Co. At a depth of 180 feet the men have uncovered a large and extremely rich body of ore, and a large force of hands have been set at work taking it out. The Monte Cristo has paid largely in the past, and the indications are good that it will pay Longley in the future.

**GRAVEL CLAIM.**—Calaveras Citizen, Sept. 22: The Alta gravel claim, owned by Honey & Co., near Reynolds' Ferry, is being vigorously worked by a dozen hands, and is making out \$5 per day to the owner. The owners are assured that this is one of the best claims in the county, from the fact that it is well prospected and shows abundance of gravel which will last for years. The owners do not wish to sell.

**TOO SMALL.**—Steam was got up at the Plug Ugly claim last Wednesday, but it was soon found that the engine was not powerful enough to do the work. It is now proposed to get a boiler in addition to the one connected with the engine, which will furnish steam enough to run the works.

**HALL CLAIM.**—Amador Ledger, Sept. 22: F. C. Hall is working a quartz lead named after him at West Point, Calaveras county, with most gratifying results. The ore body varies from 16 inches to 24 feet wide, and carries a handsome percentage of gold. Two crosscuts have been run, one an average of 812 and 815 per ton respectively. There are 25 tons of still richer rock in sight. Good judges say that it will average in the neighborhood of 500 per ton. The gold is also of superior quality, commanding \$17.32 per ounce at the mint. Mr. Hall is largely interested in other mines around West Point, which are not at present in active working.

### FRESNO.

**DITCH.**—Fresno Republican, Sept. 27: A party of men are constructing a ditch from the San Joaquin river, above Millerton, for the purpose of mining a gravel bank above the old town.

**PROSPECTIVE.**—Several parties are opening deep claims some 15 miles above Millerton, having put in two large chain pumps, run by a water wheel, and about 12-horse power, to get rid of the water. They are almost ready to commence sluicing, with the prospect of a splendid return. Quite extensive prospecting has been done during the summer on the upper Kings river, and some fair diggings have been found, though there has been no excitement. A gentleman has brought in some specimens of quartz from the vicinity of the great canyon of the Sacramento, last week, which are rich in copper, and some of them show evidences of both gold and silver. The mining resources of this county are not developed, but they will evidently become of more importance than ever before within a very short time. The amount of gold dust shipped away from here now by Chinamen is much larger than is generally supposed.

### NEVADA.

**GOOD ROCK.**—Nevada Transcript, Sept. 23: The New England is now taking out some most beautiful looking rock. It is richer than any ever before seen in the mine. They expect to commence soon to take out about 30 tons per day. They have about 50 or 60 tons on the dump, and will have mother crushing shortly.

**THE MACHINERY.** for the mill of the Pioneer reduction company is nearly all on the ground. The company expect to be in full operation by the middle of October.

**JOE.**—A mining superintendent, who has resided in this county for 10 or 12 years, informs us that he never saw a time before when there were so many idle miners as now. He has had applications for work from at least 100 men during the past few weeks, and a large number of them have families to support. It is so all over the State.

**BLUE TENT.**—The Blue Tent gravel mining company made their clean-up for the season a short time since. They took out more money than usual, and expect to increase it largely as they have the water in preparation. The company are being made for more extensive work than ever before. The company are now engaged in fitting up their claims, and expect shortly to put off a blast of 1,500 kegs of powder. With probably one or two exceptions, this is the most extensive gravel mine in the State. J. Courtney, Esq., of the Fresno office of the company, is expected here this week. The company was organized by Mr. Courtney, who is owned wholly by an English company, and they have caused to be pleased with their investment. They have spent an enormous amount of money in fitting up the claims—building ditches, reservoirs, etc. A contract was let a few days ago to build a new reservoir, which will cover eight acres of ground. The work will be pushed through as fast as possible, so the company will have the use of it as soon as it is needed.

### SAN BENITO.

**QUICKSILVER.**—Hollister Enterprise, Sept. 22: By reliable parties, who have visited the Stanton mines, this week, the report of the rich cinnabar strike is confirmed. The

shaft in which the strike has been made is down 100 feet. It was sunk upon a vein of paying metal all the way. At that depth a drift was cut north and south 60 feet and east and west 30 feet, disclosing a solid face of good ore in every portion. A retort of 300 pounds of plucked ore was made, which yielded 143 pounds of quicksilver. Tons upon tons of ore, metal are in sight in the drifts. This is decidedly the best and most substantial strike that has ever been made in any of the Coast range mines.

The Consolidated Wonder company has been pushing work along on their claims pretty lively lately, and the recent strike in the Stanton mines has lent the management considerable encouragement. The prospects are flattering, as they have struck the same indications which lead to the bonanza in the Stanton mines. Work on the Consolidated mine will be suspended for 30 days, in order to prepare for winter—building cabins, ore sheds, etc. Situated as it is, between the Stanton and Salinas mines, both of which have demonstrated their richness, it would be difficult to imagine how the Wonder can escape being a rich property.

### SAN DIEGO.

**NEW LOOK.**—Los Angeles Herald, Sept. 22: We were shown some specimens of gold-bearing quartz taken from a new lode recently discovered in the Carga Muchacho district, on the Colorado desert. This district is located in San Diego county, within three miles of the Southern Pacific railroad, and about 15 miles from the Colorado river. About two miles up three claims, the Madre Padre and Carga Muchacho, purchased by a Mr. Van Arsdale for \$5,000, were sold in San Francisco for \$35,000. The specimens exhibited to us show free gold, and were taken from a ledge two feet wide, which has been traced for over half a mile. The surface rock assays about \$70 per ton.

### SIERRA.

**BOIT STAMPS.**—Mountain Messenger, Sept. 22: We are informed by a friend that Fletcher & Co., of Sierra Valley, have erected an eight-stamp battery at their mill on the west side of the valley, and now have it running on good-looking quartz, which they found in that neighborhood. Samples of it handed us clearly resemble the fabulously rich Mispick's ore of the North fork, at Forest City. This discovery has been kept remarkably quiet, we having heard nothing of it until a few days since. Free gold is visible in the specimens we have, and the rock is undoubtedly rich. If they have much of it, they have a good thing, although we doubt if they can save the gold by the ordinary mill process. The rock is also similar to the Dolly Varden sulphurates.

**PROSPECT.**—Wm. Wilborn and A. Dennire have just struck a fine prospect in Hog canyon. They have taken out as high as 20 to 25 pounds of dirt. They have been hauling 500 hundred pounds at a load on a sled to water, working it with a rocker, making from \$50 to \$60 per day. The ground in the ravine and flats above is owned by the Tennissin company. These persons are working about 400 feet below the Tennissin line.

**THE OUTLOOK.**—The mining outlook in this county has never been better. In all directions we hear of striking good prospects and good pay. Dick Williams and Henry Hartling are finding the richest indications, their claims south of Whitney's mill, at flower ranch. Johnson & Co. are getting good pay on the point above Kanaka creek, about a mile or mile and a half from the Pileocene shaft. Bob Buzan is taking out good pay at his claims, so we learn. Wilborn is putting down a shaft on Thompson ridge, and will soon commence working double shifts on account of the rich ore. They are now sinking a shaft, and being so successful, in that it has induced men out of work to go to prospecting. This country is not half prospected yet.

**BALD MOUNTAIN COMPANY.**—The Bald Mountain company are still rolling out the gravel and rolling in the supplies. Timbers are arriving at the rate of 10 or 12 loads per day, besides other supplies from below. I saw a stationary car-wheels, one revolving axle, with oil-cell boxes attached to the axle, and a large number of oil-cells, which is a new feature in the construction of mining cars. I was informed by Superintendent Wallis that all the cars are to be overhauled and this improvement made at once. The object is to get a steadier running car, and reduce the expense for oil, which in the past year has amounted to over \$1,250. They are also economizing in the wear and tear of the cars, by putting a braze-man on the trains, thus enabling them to take a greater number of loads, consequently making a less number of trips.

The North Fork company are still pushing ahead for their gravel lead, which I am informed has already been struck in their air-tunnel. They are also sinking near the ledge, with confidence of again striking it rich when the ledge is reached. I have no doubt, under the management of this new Superintendent, Mr. McDougal, the company will eventually be taking out hundreds of dollars worth of trips.

### SHASTA.

**SOUTH.**—Yreka Union, Sept. 21: Eastern capitalists have purchased the Conklin & Magee placer mine, known as Old Hill, in Shasta county. This claim embraces 160 acres, and is one of the finest gravel beds in the county. The small portion of it which has been worked has paid splendidly, but the great drawback in working the ground has been the difficulty of getting a good supply of water to run the works. I have no doubt, under the management of this new Superintendent, Mr. McDougal, the company will eventually be taking out hundreds of dollars worth of trips.

### TUOLUMNE.

**OHIO MINE.**—Union Democrat, Sept. 21: The hoisting works at the Ohio mine were totally destroyed by fire the 10th day of August. Under the superintendence of H. A. Smith, the work was pushed forward, and on Saturday, which is excellent evidence of the richness of that gentleman. Monday morning, work was resumed sinking the shaft, interrupted by the unfortunate accident that has cost so much time and money. It is expected the lead will be reached in three weeks, when crushing will immediately ensue. Where the shaft will reach the lead, it is 22 inches in width and yields 840 rocks per ton. I have no doubt, under the management of this new Superintendent, Mr. McDougal, the company will eventually be taking out hundreds of dollars worth of trips.

**GOLDEN ROCK MINES.**—Tuolumne Independent, Sept. 22: These mines are situated in this county, on the road to the Yosemite falls, about 12 miles north of Groveland, and are owned by a company of English capitalists, Caleb Dorsey, Esq., of this city, being the Managing Agent. The company are now opening another claim about five miles below the old workings, on the same gravel range. This will give them an open dump at the river side for the whole range of claims. In the cut, at this point, they will have a hydraulic pressure of about 200 feet, with a gravel ranging from 70 to 200 feet high, all paying good gold. The new claim is much richer than the claims worked last winter, and is supposed to be richer gravel. With the fall they now have, each hydraulic will perform three times the work of those used last season, which had only a pressure of 84 feet. Four "Little Giants" will be used this winter, and we expect "judging" from the prospects of the past and considering the richness of the mine, and the great quantity of material. The contracts are already let for widening out the old ditches and making new ones, and some 40 men are at the work. Superintendent A. C. Clark is expected to get up a crew of 30 men to aid in the construction of flumes, repairs, and to fix for laying the iron pipes, etc. They expect to be ready for active operations by November 1st, when they will have a large quantity of material. The contracts are already let for widening out the old ditches and making new ones, and some 40 men are at the work. Superintendent A. C. Clark is expected to get up a crew of 30 men to aid in the construction of flumes, repairs, and to fix for laying the iron pipes, etc. They expect to be ready for active operations by November 1st, when they will have a large quantity of material.

**YUBA.** **SAND FLAT MINING.**—Marysville Appeal, Sept. 21: A few of our enterprising citizens have brought down from Oroville the machinery of the pioneer mining boat of the Feather River company, and are now putting the same in order at the Empire foundry, with the intention of operating it in the bed of the Yuba river, about half a mile below Sand Flat. The present movement is a prospective enterprise, and if the owners find it profitable, more extensive machinery will be erected. Sand Flat and the face of the hills on the north and south of the river are about to be thoroughly prospected. Some of the hills on the north side have already been worked to some extent. A Chinese company have a claim they are drifting from the bedrock, wheeling the dirt down the river 20 yards, and washing in rock and dirt, under all these disadvantages, it is reported the Chinamen realize from \$3 to \$5 to the day. On the south side of Sand Flat, upon the first bench of gravel, two companies are sinking inclines, with the intention of going to the bed in the river or in the hills. One of these companies have erected substantial and costly machinery, and have two 10-hp pumps running to keep their shaft dry. This company have been raising pay dirt for some weeks and expect to go to washing this week. Sand Flat is a rich mining territory, but its advantages for mining have been destroyed by the debris from the Smartville mines.

## Nevada.

### WASHOE DISTRICT.

**BECKER.**—Gold Hill News, Sept. 26: The main drift south at the 1000-ft level is steadily being advanced, and the face continues in favorable vein matter, composed of ledge porphyry, with streaks of quartz. The connection between the Belcher and Crown Point shaft and the south drift at the 2000-ft level of the Crown Point mine was completed this morning, and a very valuable and much-needed circulation of air is thus established, which will much facilitate the working and development operations of both mines.

**GOULD & CURRY.**—At the 1000-ft level the drift south to connect with the drift coming north from the Savage joint winze at the same level is advancing slowly, in hard, unfavorable working ground. The heat is very great in both drifts. The increase of water gave considerable trouble, but this difficulty is obviated by increased pumping facilities.

**JULIA.**—The main drift east from the winze, at the 1500-ft level, is in a fine quality of vein matter, which gives good promise of an ore development in that direction before long. The prospects for a good paying ore development at this level are very flattering.

**UNION CONSOLIDATED.**—Still repairing the main crosscut on the 1000-ft level, when the face will be reached and drifting ahead resumed. The cross-cut being run east and west from the main drift on joint account at the Mexican line are advancing well, with the faces in promising vein matter.

**UTAH.**—The main south drift at the 1150-ft level is still pushing ahead in quartz, and has about 240 feet yet to run in order to reach the south line. The drift is, at this level, steadily advancing in favorable ground. The vein at this level is over 100 feet wide, of solid quartz, which gives low assays, and should contain a bonanza of concentrated ore somewhere.

**BEST & BELCHER.**—The bottom of winze No. 2 below the 1700-ft level continues in hard blasting rock. Work will be resumed at the 1500-ft level day after tomorrow. As soon as the connection is made between the Gould & Curry and Savage at the 1000-ft level, which will be in about 10 days, drifting north will be resumed in the Best & Belcher, at the same level, for a connection with the Consolidated Virginia.

**CHOLLAR-POTOSI.**—Daily yield 80 tons of ore, assaying \$22.50 per ton on the average. The main drift east, at the 1750-ft level toward the combination shaft, is running in tough, unfavorably working material, which shows on being opened to the air, requiring constant timbering.

**SUCCESS.**—The indications at the bottom of the shaft are of a decidedly favorable nature, good streaks of quartz continually coming in.

**CONSOLIDATED VIRGINIA.**—Daily yield, 550 tons, principally from the 1650-ft level, aided by good contributions from the 1200, 1300, 1400 and 1500-ft levels, and what ore is removed in prospecting and opening out the 1750-ft level. The ore breasts and stopes of the three upper levels mentioned are looking fairly, and in the 1500-ft level the ore stopes to the southeast are giving an excellent showing. At the 1650-ft level considerable improvement is met with, as the stopes are extended southward, both in quantity and quality. The main drift west from the C. & C. shaft is being steadily pushed ahead to connect with the shaft, which is being continued downward below the 1500-ft level. Since last week's report this drift has passed out of the west ore vein and is now running in ledge porphyry, with occasional streaks of quartz. This shows the west ore vein to be about 50 feet wide. Some of the ore gives good returns, but the vein does not average as well as the other two veins passed through and being worked at this level. At the 1750-ft level the main drift south, which recently made connection with the north drift from the shaft at the 1650-ft level, is being continued south directly over the Gould & Curry drift. It is some 10 feet above it, but it is necessary to carry the sill floor through this in order to run the ore out to the C. & C. drift. Cross-cutting both east and west is now being done to test the width and value of the ore vein.

**CALIFORNIA.**—Daily yield, 675 tons, principally from the 1500 and 1600-ft levels. Some 30 or 40 tons per day come from the 1400, and 200 or 300 tons daily from the 1650-ft level. The ore breasts of the 1550-ft level show considerable improvement since last week's report, and the same may be said of the 1600-ft level, in extending the sill floors west, south and east. The connection of winze No. 5 with the 1840-ft level drift from the Ophir mine gives a splendid ventilation, a strong volume of fresh air coming through from the shaft at the 1650-ft level. The vein cross-cuts are making good progress, also the winzes below. The main west drift from the C. & C. shaft having passed entirely through the west ore vein, is now in porphyry and quartz. A vast amount of rich ore is developed at this level; much more than is needed with the present milling capacity. Twenty more stamps are about to be added to the crushing department of the Consolidated mill. At the 1750-ft level the main west drift from the C. & C. shaft is now in past the winze 76 feet, with its face in a porphyry vein, but it is expected to cut through into the west ore vein in a day or two.

**YELLOW JACKET.**—On the 2200-ft level the east drift toward the new shaft is now in 342 feet; material in face, ledge porphyry, with seams of quartz. The main south drift, at the same level, is in 301 feet to-day, with its face in quartz, carrying some ore. The drift north toward the Imperial is in 116 feet, face in porphyry. No water of any account is met with at this level as yet. At the new shaft sinking continues suspended until the new and powerful hoisting works can be completed and started into active service. This will be in about a week or 10 days, when the shaft will be kept reduced in the shaft by means of the donkey engine.

**JOE SEATES & GEORGE DOUGLASS.**—The joint shaft is down, to-day, 210 feet. It is well timbered throughout and provided with safety ladders. The station at the 200-ft level is completed, and, day before yesterday, drifting west from it to cross-cut the ledge at that depth was commenced. Good indications are of a very favorable character for finding pay dirt at this level before the west shaft is reached. A neat little assay office is just being completed in the south wing of the main building.

**CROWN POINT.**—The connection between the south drift, at the 2000-ft level, of the Crown Point and the Belcher and Crown Point shaft was completed at six o'clock, this morning. A good current of air is passing through, and the level of the water in the shafts is being lowered. The ore is being raised to come from the 160-ft level. This part of the mine having been worked out years ago, it is not known whether the ore struck at this point is the remnant of a worked-out body or something new. The ore goes \$30 to the ton, and the streak is about nine feet wide. It is proposed to further prospect by running under the present workings, which are very promising.

**JUSTICE.**—About 400 tons of ore a day are being taken out from the regular producing sections, from the 700 to the 1000-ft level. The breasts and stopes continue looking well, and are yielding the usual quality of ore.

**NEW YORK.**—Sinking the main shaft deeper below the 500-ft level progresses at a good rate, the bottom being in favorable working ground. The material is ledge porphyry, with streaks of quartz and clay. Some little increase of water is met.

**MEXICO.**—On the 1465-ft level, the joint Union-Mexican cross-cut east and west, being run from the main drift, are making good progress, with the faces in promising vein material. On the 1000-ft level the drift is in the west canyon, showing very favorable vein matter.

**EXETER.**—On the 2000-ft level the drift is in the west canyon, showing very favorable vein matter. The drift is making fair progress, without any material change in the formation encountered.

**HALE & NORCROSS.**—The pumps are running steadily as usual, keeping the water reduced as much as practicable, and as soon as the Savage pump is also in working condition again, it is thought that the water will be speedily reduced to the lower levels.

**SERRA NEVADA.**—At the 1750-ft level the drift south from the shaft is driving ahead, and the winze being sunk from the 1500-ft level to connect with it is making excellent progress.

**SILVER HILL.**—The new incline pump operates finely in freeing the mine from water, and work is resumed at the 650-ft level, pushing the drift north in very favorable vein matter.

**BULLION.**—On the 2000-ft level the combination north drift is getting into soft vein matter, which requires very close timbering and greatly retards the work.

**ORION.**—On the 1000-ft level the face of the south drift is in the ore vein. The east and north drifts are still in the west canyon rock. Splendid progress is being made in all these drifts. At the 1700-ft level the face of the drift is at the Mexican line, is making good downward progress in favorable ground.

**SETTLE TUNNEL.**—The face of the leader continues in soft porphyry, clay and other difficult and unreliable ledge matter, requiring careful and close timbering, consequently the advancement is considerably impeded and slow at present.

**LADY BYRAN.**—The new machinery has been started up and operates finely, coming fully up to the expectations.

**SAVAGE.**—The new pump rod is completed and in place. It is composed of 20 tubs, each 60 feet in length and 14 1/2 inches square. Each section when ironed weighs about 4,000 pounds.

**MAXAM.**—Drifting east and south on the 1400-ft level, with no change. Cross-cutting on the 1300-ft level continues in about the same character of ground.

**ALTA.**—Cross-cutting is commenced on the 1050-ft level, and important ore developments may be shortly expected, as the main drifts north and south at that level have been skirting the wall of the vein for some time.

**LEVATHAN.**—The work of putting up the new hoisting or follows frame is being pushed ahead. It is expected to be finished by Monday.

**IMPERIAL CON.**—The south winze from the 2135-ft level is going ahead as usual, with no material change.

**HOMESTEAD.**—The entire bottom of the main shaft still continues in a fine character of vein material.

### BRISTOL DISTRICT.

**BRISTOL DISTRICT.**—Pioche Record, Sept. 22: Prospectors, and those desirous of viewing the Jackrabbit mine, have been flocking out in that direction during the past week. Most all of those who have discovered ledges have good prospects, showing fair ore. Prospectors are extending their operations to Fairview, distant about 30 miles from the Jackrabbit mine. Fairview is the springs from which the supply of water for Bristol is obtained; these springs having been cleaned out by N. M. Miller and his sons, they are engaged in hauling water to supply the Jackrabbit and other mines around. A fine map has been made of Royal City, and as soon as the lots and blocks are staked off, according to the map, lots will be for sale.

**NO WORK.**—Owing to the bonding of the Jackrabbit mine no work is being done on it until the 30 days for which the bond was given expire.

### EUREKA DISTRICT.

**ACTIVE.**—Eureka Sentinel, Sept. 10: Never in the history of the district has there been more extended operations on the great mineral belt, or the same amount of activity displayed by mine owners in developing and prospecting their several properties than at the present date. There seems to be a general revival all along the line, and owing to discoveries made, confidence in the main stay of our prosperity once more restored. Location on the main belt to be the lode, extending from the Richmond on the north to the Hoosac on the southern end, have become of great prospective value, while on the claims that have been worked to any extent, new ore bodies have been met with that reward the faith of those who have expended time and money in the underground workings.

At the Richmond the exploitations in the western part of the mine carried on in the last six months, have opened out extensive and rich deposits of sufficient capacity to furnish work at the smelters for a year to come.

The K K yields its 60 tons per day with the regularity of clock work. It is expected that new developments will soon be made on the seventh level.

His busy notes of preparation can be heard at the Jackrabbit mine, where the information from the best of authority that the extraction of ore from the recently discovered bonanza on the 450-ft level will commence on the first of October.

The space between the Jackson and Bald Eagle, hitherto unexplored with the exception of some mere scratching on the surface, is coming to the front, and several shafts are being sunk with a view of determining its value.

The Bald Eagle has recently come into prominence. An average of 10 tons daily is sent to the Richmond furnaces, and the yield aggregates \$170 per ton, gold and silver.

The Atlas is lying idle at present, owing to litigation, and it is not probable that operations will be resumed before the spring.

The first of October will witness a renewal of ore extraction at the Hamburg. All of the connections will be made by that time, and the owners feel satisfied that the ledge will yield large quantities of precious metals.

Work is progressing at the Hoosac, both on the new shaft and in the old workings. Quite a large amount of ore has been taken out lately, and piled on the dumps. As soon as the new shaft reaches the required depth, drifts will be run and the ore bodies developed.

It will be seen by the above brief resume that the outlook for the future is a very bright one, and we can but conclude in glancing over the field that the busiest season ever known in Eureka is upon us.

### ELY DISTRICT.

**BULLION.**—Pioche Record, Sept. 22: \$19,043 in bullion were shipped by Wells, Fargo & Co. during the week.

**ALPS S. M. COMPANY.**—During the last three days there has been a marked improvement in the mines of this company. The ore body on the ninth level of the Maceppa mine has increased in size and richness, and sufficient ore is now being raised from this portion of the mine alone to run the company's mill to its full capacity. Two ore trains were sent over the N. C. R. R. to the Chicago mill during the past week, from this mine. Prospect in company's Alps mine is encouraging. Small veins of rich ore are being cut in south drift, second level, and main shaft in lowest level, south, is in good character of quartzite for finding ore.

**BULLION TAX.**—The bullion tax on the proceeds of the mine has been paid, as ordered collected by the Board of County Commissioners, was all paid by the mining companies during the week, \$51 only having gone delinquent. This is much better than having a long lawsuit in regard to the vexed question, as the finances of the Lincoln county will not stand any strain of that sort.

### OSCEOLA DISTRICT.

**A BEAUTIFUL SPECIMEN.**—Pioche Record, Sept. 22: We were shown, yesterday, by Mr. Poujade a very beautiful and valuable gold specimen from Osceola, taken from the



## THE ENGINEER.

## The Eddystone Lighthouse.

Not a little interest was awakened at the last meeting of the British Association, at Plymouth, by a very interesting paper on the Eddystone lighthouse, by Mr. Isaac Douglass, who surprised his hearers by announcing that Smeaton's great work was not destined to exist much longer. Owing to a very considerable tremor which occurred with each wave-stroke during heavy storms from the westward, fears had been entertained for the safety of the structure, particularly as sea-water had frequently been driven through the joints of the masonry. The upper part was strengthened in 1839 and 1865 with internal wrought-iron ties, extending from the lantern floor downwards to the solid portion of the tower. On the last occasion he found that the chief mischief arose from the upward stroke of the sea at the cornice, but repairs were effected, and further leakage prevented. The tower was still sound, but unfortunately the gneiss rock on which the lighthouse was built had been seriously undermined and weakened by the sea. This appeared to be chiefly due to the incessant straining of the laminated rock by the heavy sea-strokes on the tower. It had, therefore, been determined to erect another lighthouse of larger dimensions, for which a good foundation had been discovered about 120 feet off. The elevation of the light for a range of 19 nautical miles was very desirable, so that it might be extended more towards the Channel rock, and made to overlap the range of the neighboring Lizard lights to the westward. Unfortunately, the sea rose during stormy weather considerably above the top of the lantern, thus often eclipsing the light and altering its distinctive character. This was a matter of much greater importance in the present day than it was at the date of the erection of the structure, from the enormous increase in the number of shipping, and the additional light-houses which had been established, each having a distinctive character. The power of a light in so important a position ought to be raised to the first-class; but the capacity of the present tower was insufficient for this as well as for the provision of a first-class fog-signal. Telegraphic communication between rock lighthouses and light-vessels and the shore, for the purpose of reporting casualties at sea, was very desirable, but the difficulties which presented themselves appeared at present too considerable to justify the necessary outlay for construction and maintenance. Four lightkeepers were attached to the Eddystone, three being constantly on the spot, and one on shore in rotation. They were relieved from Plymouth monthly by a steam vessel. The average annual cost of maintaining the lighthouse was about £535. In conclusion, he could not help expressing a hope that if Smeaton's noble structure had to be taken down, as doubtless it would be after the erection of the proposed new lighthouse, the nation would consider it as worthy of a site on English soil as Cleopatra's needle.

**WATER VERSUS RAIL.**—As a means of affording increased facilities for competing with German commercial encroachments, important plans are contemplated in France looking to an extension of the canal system. It is a striking fact that these new facilities should be sought through canals rather than through railroads, in face of the common opinion that railroads have superseded the old-fashioned method of internal water carriage. We find in the French journals, however, says the *Coal Trade Journal*, facts which seem to throw light on this preference. The railroad men of this country will be surprised at the following statement, which we take from the *Paris Union Nationale*: "Our internal navigation is still vital enough to effect a saving to trade of 56,000,000 francs. The canals and rivers transported during 1875 1,721,000,000 tons of goods at the small cost of 4,177,940 francs. If these 1,721,000,000 tons had gone by rail, the charge would have been some 56,000,000 francs in addition."

The enormous difference here shown between canal and rail charges seems almost incredible; and yet it is clear that there must be some very substantial advantages in favor of water carriage, or the additional carrying facilities now desired would not be sought through constructing new canals. These facts deserve the attention of those in our own country who have so decidedly assumed that our State canals must inevitably be superseded by the railroads. For our own part, we have not yet reached that conclusion, nor does the present relation between the canals and the railroads warrant it.

**STEEL RAILS OF DOUBLE LENGTH.**—At the steel works of the Lackawanna Iron and Coal Company, in Scranton, Pennsylvania, a great improvement has been made recently in the manufacture of steel rails. Heretofore the rails have been turned out at the standard length, 30 feet, but they are now made in double bars, 60 feet long. The great advantage of making the double length instead of the single length lies in the saving effected in cutting off the cross ends of the rails, which is in itself a saving of about 50%. Although the bar is rolled 60 feet in length, it is too cumbersome to be easily handled in the laying of tracks, and is, therefore, cut in two as soon as rolled. The great advantage lies in the fact that there are only two ends to be trimmed in a length of 60 feet, instead of four, as formerly.

## Ancient Aqueducts.

Mr. J. H. Parker, in his book on the "Aqueducts of Rome," gives us some facts which may well put modern municipalities, not to speak of governments, to the blush. The exact quantity of water daily poured into Rome in Trajan's time is known from careful estimates of Frontinus, the head government surveyor and engineer. It amounted to 24,805 *quinaries*, a section of which amount would be just upon 120 square feet; i. e., in Mr. Parker's words, "we can form some notion of the vast quantity, if we picture to ourselves a stream 20 feet wide by 6 deep constantly running in at a fall six times as rapid as that of the Thames." It is calculated that, when Trajan's and the Aurelian aqueducts were finished, the daily supply was quite 332½ millions of gallons; i. e., at least 332 gallons per head, for the population of old Rome probably never exceeded a million. Nowadays 40 gallons per head per day are thought ample, and by many excessive; these 40 including, of course, all that is used in manufactures, in street cleansing, sewer flushing, etc. The site of old Rome was notably unhealthy, and there was much overcrowding; yet after the chief aqueducts were made, no city of antiquity was so free from epidemics. Another point to which Mr. Parker calls attention is the care with which the best water (such as the Marcian, now lately brought into use again) was kept wholly for drinking purposes, while the muddier and less pure (such as the Anio Vetus and Novus) were used for street and sewer flushing, for the baths, and for scenic representations.

**SHOOTING LIGHT.**—The *London Times* says one of the most simple and ingenious contrivances for the purpose of investing a fleet with a zone of light, through which no enemy could pass without being observed, has been devised by M. Ferdinand Silas, of Vienna. This consists of an inextinguishable lightning shell, similar to a common shell, which can be made to fit any gun, and can accordingly be projected to any distance. The projectile consists of three parts, one within the other. Within the shell proper is a lining of wet sponge, and within this is a glass bottle which fills the whole cavity, the bottom of the shell unscrewing to admit of its entrance. This bottle is filled with various charges of phosphide, none of which, however, is to be less than 10 pounds. A small channel is bored through the sharp point of the shell, in order to allow the air to mix freely with the wet sponge, and there are a couple of apertures in the head, which are plugged with wooden stoppers covered with leather. Through the movable bottom of the shell a steel striker is inserted, which is fitted with a spring and communicates with the glass bottle within. When the light shell is fired the spring striker is driven forward by the explosion, like a gas check, and so breaks the bottle; the water contained in the jacket sponge then penetrates through the broken glass and saturates the phosphide; phosphoretized hydrogen is immediately generated in large quantities, by the pressure of which the stoppers are forced out, and two streams of illuminating matter are poured upon the sea. The light burns with great brilliancy for a considerable time, and is claimed to be inextinguishable.

**SPAIN AND AFRICA.**—The Spanish engineers who are to undertake the work of the proposed international tunnel between Spain and Africa at the Strait of Gibraltar, have been at Marseilles several days. Their machines very much resemble those which are at present used at St. Gothard. The projected tunnel is to extend from within a short distance of Algiers, on the Spanish side, to between Tanger and Centa, on the African side. The length of the submarine tunnel will be nine miles, with an inclination of one foot per hundred. The approaches will have an extent of six or seven miles. The greatest depth of the sea is 3,000 feet. A thickness of 300 feet of rock will be left between the roof of the tunnel and the sea bottom, making the greatest depth of the tunnel 3,300 feet below the level of the sea. The cost is estimated at £4,000,000. By means of this tunnel and the one between Dover and Calais, travelers will be enabled to go from England to Africa by land.

**THEY ASK FOR MORE.**—New Orleans desires a shorter route to the sea than that formed by Mr. Eads by deepening the South Pass. It is proposed to dig a ship canal between New Orleans and Barataria bay—an estuary of the sea that penetrates far into the land on the south coast of Louisiana. The distance from New Orleans to the Gulf of Mexico by this route would be only 58 miles. The cost of digging the canal, it is estimated, would be \$5,000,000. Neither Government nor State aid is asked; the advocates of the canal solely ask Congress to grant them the right to use the tidal waters of Barataria bay.

**A TWO-FOOT CHEAP RAILWAY.**—The two-foot gauge railroad between Billerica and Bedford is making good progress, and will be soon finished. The passenger cars, now building at Laconia, N. H., will be a decided novelty, as they will have a row of single seats on each side. The road is eight and one-half miles long, and will cost about \$50,000, or less than \$6,000 per mile, being only one-eighth the cost of the ordinary railways.

## Lassen County Mining Interests.

It is a recognized fact, and one well established, that no agricultural community can prosper peculiarly unless an available market can be had for their products; particularly so where the scope of country susceptible of tillage is limited, and the surplus hauled by wagons long distances to enter into competition with those raised in the immediate vicinity of the market sought.

Where communities of this kind exist in mountain counties, isolated from lines of railway, the prosperity of the farmer and business man depends upon the number of employed consumers the country may be made to maintain, and their number can only be increased by opening new avenues of industry.

The particular case under consideration is our own productive valley, which is compelled to find a market for all its surplus at Reno. That this evil may be remedied is a fact requiring little or no demonstration, as the prosperous condition of the agricultural element in the foothills and mining counties where the mining interests have been developed will testify. In our own case we have in our immediate vicinity as sure a prospect for a basis of future prosperity as could be desired. There is abundant evidence of the existence of both quartz and placer gold in paying quantities; considerable placer gold having been worked to a good profit in early days. The quartz crops out as indisputable evidence of its own existence. A slight review of the history of mining operations in this county will suffice to show why this all-important industry has been allowed to decay. The class of men making the first discoveries were generally, if not all of them, from the lower counties, where nothing less than "ounce diggings" was considered pay. Much ground of this character was found; but, as is universally the case in gold found in the alluvium, it was in spots; upon the slightest decrease of the yield, the ground was abandoned as worthless.

Miners arriving at subsequent periods were informed that the pay ground was worked out, water was too scarce—in fact, nothing was to be made. As the natural consequence, placer mining was almost entirely abandoned. A number of the pioneer miners, now residing in this valley, will tell you the same story when asked in regard to the placers.

The business men of Susanville will tell you the same thing, or at least speak discouragingly of it. In regard to the quartz interests there have been what may be properly termed two excitements, which resulted as the majority of them do—in nothing.

Inexperienced parties generally constituted them, and their only desire was to find some rich surface showing as a basis for speculation, without the slightest intention of developing property for any real merit it might possess, or working it for a future profit. With one or two exceptions nothing was found to suit their purposes, and, as in the case of the placers, it was also allowed to decay. Many of our readers will recognize the truth of these statements.

In conclusion, we assert the fact that we have mines equal to any in the State, if properly developed; in evidence of which the following facts are submitted: Lying along the north base of the range, separating us from Indian valley, a continuous stratum of alluvium is found, carrying gold in paying quantities; the greater portion of which can be worked to a fair profit, by a more systematic and economical method than heretofore employed.

Individual owners of ground, by associating their labor in building ditches, can utilize many acres, which at present are of no practical value. Gold is also found in the basins and foothill system of the south side of the range, where numbers of men could find highly remunerative employment for four or five months of the year. Reservoirs for storing water can be constructed at trifling outlay of labor, and, if properly managed, a water supply for six months can be guaranteed.

The character of gold found on the north side shows conclusively its quartz origin, while the veins crop out as evidence of its source. It does not follow, however, the parts cropping out above the surface carried the gold; on the contrary, it was the softer portion of the veins, which, by the action of nature, have been decayed and worn down, thus liberating its precious metal. The remaining portions of these veins ought to be sought for; they may be covered to a greater or less depth with the detached matter from the country rock; but the hard croppings seem to indicate the direction in which to prospect. A careful examination of the hardest vein matter has rarely failed to show the existence of gold.

Time and energy on the part of the prospectors is all that is required to unearth many valuable mining properties; labor, intelligently directed, will insure success to many, as they have the indisputable evidence before them to justify its expenditure. These statements apply with equal truth to several of the adjacent sub-ranges.

In this connection the Union lode may be mentioned—situated on the north base of Diamond mountain. It has evidently been a prolific source of the alluvial gold found below it in the gulches.

Appearances indicate it to have been mismanaged from the date of its discovery, judging from the amount of waste work done by parties in search of rich pay streaks.

This truly magnificent property, under competent management, bids fair to be second to none in the State in point of productiveness.

Other mines might be specified which are now lying idle for want of active men to handle them. The development of this paramount mining interest is a subject well worthy of the earnest consideration of the people of Lassen county—encourage it—give a hearty support to those willing to engage in it, and your prosperity will be insured.—*Lassen County Farmer*.

**PROF. HAYDEN'S OPINION OF THE YOSEMITE.**—Prof. Hayden, of the U. S. Geological Survey, made account of his visit to the Pacific coast in company with Sir Joseph Hooker and Dr. Asa Gray, to take a trip to the Yosemite valley and bend his sharp powers of observation to a theory of its formation. The Yosemite was the first wonderland of the nation's domain set apart as a public resort and protected from the padlock and fence of the private improver and parchment farmer. In 1871-72 the Professor's expedition to Montana and his exploration of the Yellowstone region led to such interest in the geysers and to other natural phenomena of that strange territory, that Congress followed the precedent of the Yosemite and consecrated 3,571 square miles of the Yellowstone as a national park. Prof. Hayden had therefore some pride in halting by the way for an examination of the precedent. He was profoundly impressed with the scenery, and, although time did not permit of a thorough sifting of the origin of the valley, he inclined to the opinion that the supposition of a cataclysm, such as the sudden sinking of the valley, leaving its present enclosing walls frantically separate, is incorrect; but rather the formation of the valley is the result of erosion, slowly accomplished during a long lapse of years by water and perhaps by ice. This gradual process of grinding the material of the rocks into fine particles and the transportation of the debris by streams, such as the mining streams of to-day, only requires the allowance of time to account for the valley; and time in other regions has permitted formations quite as wonderful to be eroded. For instance, it seems clear to him that the channel of the Colorado has been slowly eaten away for a distance of 200 miles, over one mile in depth, and in some places over a mile in breadth.

**THE PREVENTION OF CORROSION.**—Prof. Barff lately read a paper "On the Formation of the Black Oxide of Iron on Iron Surfaces for the Prevention of Corrosion," before the British Association. The paper was very brief, but highly instructive, and was illustrated by various specimens of cast and other iron which had been experimented upon. At the commencement the Professor remarked that the decomposition of steel and iron by sufficiently high temperature had long been known to chemists, so that he could not lay claim to the discovery of it, although it had been attributed to him by some. The paper then proceeded to detail the experiments which the Professor had made for the prevention of corrosion by a steam superheater. One important result of the experiment was that different temperatures were found to have different effects upon the appearance of castings, a higher temperature producing a brighter surface. In conclusion, the Professor stated that he had several important experiments now in hand, but as yet he was unable to publish the results. The President of the section, Dr. Ahel, read a note upon the same subject from Mr. Bower, which affirmed that, from the writer's experiments, he found that direct oxidation of the air produced in cast iron a coating which is equal to superheated steam. A brief discussion followed, in the course of which the President referred to the present method of protecting or coating gun barrels, and to the important results which Prof. Barff's experiments would probably ultimately have upon such methods.

In Ohio there are 56 railroads, exclusive of the narrow-gauge roads, eight of which did not pay their running expenses during the year 1876. Thirteen paid no interest on their bonded indebtedness. Seven are in the hands of receivers. The gross receipts of these roads for 1876 amounted to \$34,119,049, while the operating expenses were \$24,404,565, leaving \$9,714,484. The total cost of these roads, including all debts, was \$317,222,232, showing that the net earnings are a trifle over three per cent. of the invested capital. The total bonded indebtedness is \$160,000,000, all of which bears six per cent. interest or more, so that the net earnings will not be sufficient to pay the interest on the bonded debt, and leaving nothing for the millions invested by stockholders, of which there are 17,000. If, asks the *New York Shipping List*, this is the result of railroad investments in Ohio, the leading State in agricultural products, with growing manufacturing enterprises, and coal and iron in abundance, what must be the condition of railroad property in less populous and less favored States?

ONE of the latest Yankee ideas is a Turkish bath on wheels. It is a car that can run behind the sleeping coaches of an express train. It has a drawingroom, a Russian and plunge bath, shampooing rooms, and all the other accommodations of a Turkish bath house. The temperature of the rooms varies from 80° to 160°, and the compartments are lighted from the roof with blue glass. Travelers can bathe as well as eat, drink, and sleep on the rail. Such a car can be switched off on a side track in any town or village, and remain a day or two for the accommodation of the residents.



## Ventura Sulphur Beds.

The *Ventura Free Press* says: We are obliged to Mr. Martin for information as to the use of the raw sulphur which exists in such quantities in the mountains north of us:

The sulphuric acid, which forms the leading ingredient in cleaning and purifying the petroleum oils, can be manufactured from the sulphur found on these mountains, and made so cheaply that it will not cost over \$40 per ton. In Michigan they have been making acid from the refuse of sulphate of iron picked from the coal, which was bought in Danville, Ill., at \$2 per ton, and freight for 150 miles paid thereon, when it was made into acid and shipped to Cleveland and sold for two and one-half cents per pound. The present price of sulphuric acid is five cents per pound, and there is little doubt that if our oil interests are increased, a manufacture of this kind will be one of the most profitable institutions connected with our industries. The mode or process seems to be somewhat intricate. The sulphur is burned in kilns, and the gas proceeding from it is called sulphuric acid gas. The niter is mixed with a certain quantity of sulphuric acid in an iron pot and boiled. The gas from this is called hypo-nitric acid gas. These gases mix or pass together to a condensing chamber. The process of gases in the chambers are hypo-nitric acid and sulphurous gas, which, when mixed, through the agency of moisture, falls through traps to the bottom of the chamber; and after a repetition of this with some other intricate treatment, passes through a draft pipe and becomes the desired article. The sulphur is so abundant here that it would compare favorably with the cost of manufacturing oils in the East, the sulphuric acid being used in large quantities; and while manufacturing this article, muriatic, nitric and acetic acids would also be made, for which a ready market always exists.

**THE PERUVIAN NITER-BEDS.**—On the Pacific coast of South America, extending from the fourth to the fortieth degree of south latitude, about 2,400 miles along the slope of the Andes to the sea, in Bolivia, Peru, and part of Chile, there has been found a line of deposits of sodium nitrate, the "Peruvian niter." The beds are of variable thickness, covered by from one to 10 yards' depth of earth and half-formed sandstone. The dry soil of the most of this rainless country is pervaded, in some degree, with this deposit. The mummied remains of the old Peruvian people are embalmed with it by the earth in which they are buried; and its crystals glisten on those ghastly relics which were presented in the Peruvian department of the Centennial exhibition, and those brought to this country by Dr. Steere. It is estimated that in the Province of Tarapaca, within 50 square leagues, the quantity of the niter is not less than 63,000,000 tons. The appropriation of this vast resource has been taken up rather slowly, but has much increased for 10 or 12 years past. Vessels laden with it go to the coasts of manufacturing countries. At Glasgow, the works devoted to the production of ordinary saltpeter from the niter of Peru extend over acres of ground. In 1868, 100,000,000 pounds were used in Great Britain. As yet it has been applied to the nourishment of crops only to a limited extent. But this seems to be its chief destination, and for this use it lies in the earth, a vast mine of wealth, for the disposal of coming generations. When multiplied population puts the sustaining power of the earth really to the test, this fund of sustenance on the Peruvian coast must come to outweigh in value the gold and silver mines of the Californian coast.—*Popular Science Monthly*.

**INSTITUTION OF NAVAL ARCHITECTS.**—This institution is a favorable instance of the rapid growth of societies with a clearly-defined object. Since it was launched, in 1860, it has increased greatly in importance, and has done excellent service in directing the attention of naval architects to the scientific side of their profession. There is ample evidence that good ships were built in the olden time by rule of thumb, as people spoke intelligently before grammar was invented; but there can be no doubt that the reduction or elevation of any kind of human effort to scientific rule is invariably a gain. Now that shipbuilding, especially as applied to warlike purposes, is passing through a period of transition, the deliberations of scientific marine architects are peculiarly valuable, inasmuch as, until a great sea-fight actually occurs, scientific theories must regulate the construction of our fleet. It was a happy idea to inaugurate a series of autumnal meetings by a visit to Glasgow, the great stronghold of the iron shipbuilding trade since that branch of industry has been driven from the Thames. The figures quoted by Lord Hampton show, indeed, a serious falling off in the building trade of the Clyde; but while 174,000 tons of shipping per annum are turned out there is no need for despondency. We must confess that we do not follow Lord Hampton in what appears to us his inordinate admiration for sailing vessels. More particularly calling for remark is his observation that "in our men-of-war he would rather see auxiliary screws than solely screws." We thought we had enough of sailing ironclads when the *Captain* went down.—*Iron*.

GERMANY entertains the idea of establishing an export and coasting trade in coal. Some 30 new pits have lately been sunk, or are undergoing the process of sinking, and it is estimated that she could readily increase her present output 50%.

## USEFUL INFORMATION.

## Obtaining Coloring Matter from Coal.

During the past few years the coal-tar colors have been in much favor, and various chemists have given great attention to their production. Dr. Mensel, of Breslau, says the *London Mining Journal*, has now invented a process according to which fossil coal, cannel, anthracite, or bog-head coal are treated advantageously in fine powder with oxidizing chemical compounds by ordinary or higher temperatures in suitable vessels. The most advantageous method of carrying out these improvements is to heat the different coals, finely powdered with nitric acid or with potassic or sodic nitrate, and sulphuric acid. Also potassic chlorate or potassic chromate, or hypochloride of lime, or compounds of manganese, may be used for the reaction, with or without an acid. By the action of nitric acid, or nitrates with acids, compounds of nitrogen with oxygen are developed, which are to be used in the manufacture of sulphuric acid or salts, containing nitrogen bound to oxygen.

Coals treated in this manner undergo a great change; a great part of the coal can now be extracted by caustic alkalies, and by ammonia, or by the carbonates of soda, or potassium, advantageously. By heating the solution of alkalies with the product of the above treatment, a deep brown-colored solution and a black residue is obtained. The black residue is a deep black covering color, which may be used for line color (glue color) or oil color, or with bone black, or instead of bone black, soot or graphite. It may also be applied for the black for printing, or for blacking, and washing, painting, besprinkling, or other like purposes. The brown solution of the alkali salts may be used directly for coloring, for instance, by fluids, by soap, or otherwise. The solutions give, by evaporating the alkali salts, and by decomposition with metallic salts, new salts of metals, which are to be used as colors.

By the method of decomposition the salts of strontian, of barium, of magnesia, of aluminium, of manganese, of iron, of cobalt, of nickel, of zinc, of cadmium, of lead, of tin, of copper, and chromic oxide are obtained. All these bodies are black, black brown or brown colors, which may be mixed with other coloring matters. They can be used for painting, printing and coloring. These colors are obtained as precipitates and can be purified by water. The alkali solution can also be decomposed by the soluble metallic salts above (cotton or wool), and may so be used by the dyer. The alkali solution can also be decomposed by acids; a black brown precipitate is obtained, which may be washed in water, and which may also be used as a coloring matter. This black precipitate is the acid in which the coals are partly converted by the treatment with oxidizing compounds. By these means fossil coal is oxidized, and the black residue obtained by the decomposition of the oxidized fossil coal may be applied as a coloring matter to various useful purposes. The product of the oxidation of fossil coals is soluble in alkalies, and the compounds of this product of oxidation may be applied as a coloring matter to various useful purposes.

**PRESERVATION OF WOOD.**—During the excavation of a canal in Berlin, the workmen struck upon 12 perfectly preserved coffins, which laid apparently in four graves, each containing three superimposed coffins. The site of the discovery corresponds with the cemetery that existed even as late as 1620 in connection with the poor-house and pestilential hospital. The corpses must in consequence have been in the earth for at least 260 years. Notwithstanding this long period, the coffins, as well as their contained bones, are in a perfect state of preservation; articles of clothing have even been found still clinging to some of the bones. Prof. Virchow found, upon investigation, that the coffins were coated on both sides with a thick layer of tar, the wood itself appearing to be young oak of three cm. thickness. A silicious crust was likewise found on the inner side of the coffins. The wood is so hard that axes and saws were broken in the attempt to cut it. The wood is held together by long wrought-iron nails which appear very different from those used at present. They are 8 cm. long, 4 mm. wide, and 2 mm. thick. They all have a groove running along their entire length, apparently to increase their surface contact. The nails are very much rusted, but are still sound in their interior.

**UTILIZATION OF IVORY DUST.**—In the manufacture of paper knives, keys for musical instruments, and other articles, large quantities of ivory dust are annually produced, and endeavors have been frequently made to utilize it by means of some agglutinative solution which would enable the mass to be molded into various forms, but hitherto all attempts have ended in failure more or less complete. Much of the clean ivory dust is boiled to obtain the gelatine, which makes excellent jelly when suitably flavored; and the refuse is sold to the manure-makers. M. Latry, however, has described to the French Society for the Encouragement of Industry a method by which ivory dust and the dust of bones can, by means of an agglutinative substance, and under the influence of a high temperature and compression, be molded into various articles, suitably colored, and of extreme hardness.

## Fire-Proof Cottages.

At a late session of the American Institute, New York, says the *Manufacturer and Builder*, there was submitted a report of the proceedings of the Forest Congress, held at Sea Grove, N. J., in September last, a prominent reference in which report was to the scheme, generally discussed at the Congress, of constructing fire-proof cottages; primarily, as a means of lessening the consumption of forest timber, but also for the general reason that such structures are, on most accounts, more desirable than homes built of wood. Papers read, addresses delivered and discussions engaged in favored such a plan of building, and the generally expressed belief was that good fire-proof cottages, schoolhouses, churches, etc., are entirely feasible, that their cost is but little more than for wood structures, that they are more durable, healthier for inmates, will reduce fire and life losses, and will naturally lessen the drain on the forests of the country. French tile and terra-cotta were especially recommended as desirable fire-proof building materials, the last-named substance being particularly enlogized on account of its perfect adaptation to attractive finish of outer and inner walls, and because of its fire-proof and ventilating qualities.

Who can tell but that the investigations and experiments suggested by the Forest Congress shall not prove the initial in a movement to work a revolution in the matter of the material used for house construction?

**AN IDEA IN REFRIGERATION.**—Housekeepers who are troubled with moisture in their refrigerators will be glad to learn how it may be prevented. Fresh, unslacked lime, in small quantities, say a quart, placed in a refrigerator, will gradually absorb all the moisture in the provision chamber. The consequence will be a dry cold atmosphere, in which meat and other articles sensitive to the presence of moisture can be kept sweet for a long time. A little experience will soon enable one to know when to renew the lime and how much to use at a time.

## GOOD HEALTH.

## Try to Stop Coughing.

A gentleman called upon us recently, says *Hall's Journal of Health*, who actually escaped from the fangs of consumption some years ago; and we are induced to present the circumstances: "You speak of coughing continually. Let me suggest to you the query whether this is not unnecessary and injurious? I have long been satisfied, from experience and observation, that much of the coughing which precedes and attends consumption is voluntary. Several years ago I boarded with a man who was in the incipient stages of consumption. I slept in a chamber over his bedroom, and was obliged to hear him cough continually and distressingly. I endured the annoyance, night after night, till it led me to reflect whether something could not be done to stop it. I watched the sound which the man made, and observed that he evidently made a voluntary effort to cough. After this I made experiments on myself, and found that I could prevent myself from coughing, sneezing, gaping, etc., in case of the strongest propensity to these acts, by a strenuous effort of the will. Then I reflected that coughing must be very irritating and injurious to the delicate organs that are concerned in it, especially when they are in a diseased state. What can be worse for ulcerated bronchia, or lungs, than the violent wrenching of a cough? It must be worse than speaking. A sore on any part of the body, if constantly kept open by violent usage, or made raw again by a contusion just when it is healing (and of course begins to itch), will grow worse, and end in death. Certainly, then, a sore on the lungs may be expected to terminate fatally if it is constantly irritated, and never suffered to heal; and this, it seems to me, is just what coughing does for it. On the strength of such considerations as these, I made hold to ask the man if he could not stop coughing. He answered no. I told him what I thought about it, as above. He agreed to make a trial; and, on doing so, he found, to his surprise, that he could suppress his cough almost entirely. The power of the will over it increased as he exercised it, and in a few days he was mostly rid of the disposition to cough. His health, at the same time, evidently improved, and when I last saw him, he was in strong hopes of getting out of death's hands."

## Early to Bed and Early to Rise.

The visit of the emperor of Brazil, and the daily chronicle of his round of work, bring forcibly to the mind the great value of early rising. We, says the *London Lancet*, have been trying to estimate the commercial gain to this metropolis which would accrue if these imperial habits were imposed upon us. If we rose with the sun, instead of the usual hour of eight o'clock, we should gain, on an average, two hours' additional daylight throughout the year; and if we sought our beds two hours earlier to compensate for our early rising, we should be saved the expense of artificial light for 730 hours in each year. Now, there are, in

round numbers, 450,000 houses in London, each of which we may suppose requires five gasburners, or their equivalents in lamps or candles, after dark. At present we may reckon that 2,250,000 gasburners are burnt for 730 needless hours in each year; and if we take the average consumption of gas at three feet per burner per hour, we may say that each burner consumes, in round numbers, 2,200 feet of superfluous gas per annum, which gives a total for the metropolis, in round numbers, of 500,000,000 cubic feet of gas, or its equivalent, which might be saved. Taking the cost of gas at 3s. 9d. per 1,000 cubic feet, we find that the saving to the metropolis of early rising might amount, in the matter of artificial light alone, to no less a sum than £900,000 per annum.

When we consider, also, that every gasburner requires to be supplied with nearly 2,000 cubic feet of air per hour, and that after dark the demand for fresh air is nearly doubled in this already stuffy city, because the wants of luminators are added to the wants of man, the gain in health would be scarcely less than the saving in money.

If, too, which is not likely, we were to make as good a use of our time as the emperor, we should perhaps verify the old saying that "Early to bed and early to rise make a man healthy, wealthy and wise." May we hope some day to see distinguished persons enjoying the pure crisp air in Hyde park at 6 a. m.? May we ever be allowed to have a daylight theater that does not reek of humanity? Shall we ever see the abolition of "evening church?" And will the House of Commons, the pioneers of sanitation (!), ever set us a good example in the matter of keeping what Mrs. Grundy speaks of as "decent hours?"

**VAMPIRE WOMEN.**—"Vampire women" is the suggestive title of an article in a recent number of the *New York Tribune*, which is devoted to "the lean, bloodless, miserable girl or wife, flabby and unable in flesh and mind, whose disease takes, in the family, the vague name of debility, or nervous exhaustion, or spinal disorder." The majority of young girls, the writer proceeds to say, are born tired. It is not affection which makes them thin of blood and morbid in brain at the age when the current of life should run fullest and reddest. They are called "vampires" not merely because their own existence is unhealthy, but because they sap the energies of those about them. A regimen of iron, exercise, change of air, etc., which may quicken the pulse in the patient's veins for the time, neither reddens her blood nor rounds her cheeks permanently. The system of cure for patients of this description adopted at the hospital for nervous diseases in Philadelphia is the only one that has thus far been found effective. Absolute rest in bed for six weeks or two months is enjoined. A milk diet is ordered, and the lack of exercise is supplied by treatment known as massage, or kneading every muscle and square inch of flesh in the body and by electricity. Reading, sewing or any other occupation is absolutely prohibited. It is said that nervous and debilitated women, who have been subjected to this treatment, have come out of the hospital at the end of the time fixed perfectly restored in mind and body, and without a trace of dyspepsia, hysterics, or anæmia.

**MILK AND LIME-WATER.**—Milk and lime-water are now frequently prescribed by physicians in cases of dyspepsia and weakness of the stomach, and in some cases it is said to prove very beneficial. Many persons who think good bread and milk a great luxury frequently hesitate to eat it for the reason that the milk will not digest readily; sourness of stomach will often follow. But experience proves that lime-water and milk are not only food and medicine at an early period of life but also at a later, when, as in the case of infants, the functions of digestion and assimilation have been seriously impaired. A stomach taxed by gluttony, irritated by improper food, inflamed by alcohol, enfeebled by disease or otherwise unfitted for its duties—as is shown by the various symptoms attendant upon indigestion, dyspepsia, diarrhea, dysentery and fever—will resume its work, and do it energetically, on an exclusive diet of bread and milk and lime-water. A gullet of milk may have four table-spoonfuls of lime-water added to it with good effect. The way to make lime-water is simply to procure a few lumps of unslacked lime, put them in a stone jar and add water until the lime is slacked and of about the consistency of thin cream; the lime settles, leaving the pure and clear lime-water at the top.

**DANGER OF OVERSTRAINS.**—The dangers of such sudden strain are not confined to failure of the heart upon the spot. Very commonly in those cases where apparently healthy old people are found dead in bed, there may be traced a history of sudden effort made during the preceding day. The overstrain so put upon the heart does not manifest itself fully at the time; but during the sleep of the ensuing night. Even in cases of fatal syncope of the heart, preceding ruptures are found at times with a clot blocking the opening. These are extreme cases truly, but they demonstrate beyond doubt that serious injury may be inflicted upon the heart without instantaneous consequences. With elderly people sudden exertion during the day is undoubtedly one cause of failure of the heart's action during the night; so that the effort may really be only apparently made with impunity.



# MINING SCIENTIFIC PRESS

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Our latest forms go to press on Thursday evening.

SAN FRANCISCO:

Saturday Morning, Sept. 29, 1877.

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## The Week.

The most startling event of the week has been the Patent Office fire in Washington, when some 87,000 models were destroyed and great damage done. This was really a national calamity and its effects will long be felt. The Patent Office Department, however, some years since, adopted the wise policy of publishing full specifications and engravings, which are scattered all over the country, so that complete records could never be destroyed. There will be very little detention in the business of the Patent Department on account of the fire; but the accident will draw the attention of the country to the necessity of putting up absolutely fire-proof structures for Government records, documents and similar property. There is little of interest in mining matters to note, except some important air connections on the Comstock, which are referred to in our Mining Summary. The mines of Tuscarora district are attracting some considerable attention just now, and look exceedingly promising. We give elsewhere the premium list, as far as completed, of the Mechanics' Institute fair, which closed last Saturday, and are pleased to see the familiar names of many of our old patrons appear therein.

## Mica.

A correspondent writing from Prescott, Arizona, sends us some specimens of mica, not of a superior quality, asking us to hand the same to parties in this city dealing in the substance. He also wants to know whether it occurs in lodges or pockets; what should be the formation; what is the value in this city; how deep is the average lead; how should it be prepared for market, etc. Answers to some of these questions may be of interest to others than our correspondent.

There seems to be an impression that mica is a rare substance, and as such is very valuable. This is by no means the case, for it is neither very rare nor very valuable.

Mica is a name in mineralogy given to a group of the silicates distinguished by their remarkable lamellar structure and the elasticity of their laminae. The minerals crystallize in large rhomboidal prisms, which separate with great facility in leaves parallel with the base of the crystal. These may be subdivided until several thousand plates are required to make the thickness of an inch. There are several varieties, the most familiar form of which is muscovite, which is found both disseminated and in veins; and in many of the stratified rocks it is an incidental constituent derived from the destruction of the original formations to which it belonged. The mineral is thus seen to be very generally disseminated; but certain localities are distinguished for the production of large plates of it. In Siberia they are found more than three feet across, and have been obtained of great size in Sweden and Norway. This is also the case at Acworth, Grafton and Alstead, N. H., and elsewhere. Mica is mostly used for the doors of stoves and sides of lanterns. It has also been used as a substitute for window glass, for optical instruments, for bronzing powder, and is serviceable for holding small objects for microscopical examination.

The substance is probably mined more extensively in North Carolina than anywhere else in this country, and the mines in Mitchell county, in that State, supply nearly all that is used in the United States. A number of mica mines on this coast have been opened at different times, but we never heard of any making any money out of the substance here. Its uses are so limited that the demand is small. The principal sale would be to Eastern stove manufacturers, and the North Carolina miners can furnish a great deal more than is used. The people owning these mines have a kind of monopoly of the trade, as the article they furnish is first class in every respect and they can mine and produce it cheaper than we can here.

There are extensive deposits of this substance known to exist in several places in California and Nevada. We understand that a company is being formed here now to work some mines about 50 miles from Elko; but from what we learned, some time since, about the supply and demand, we have doubts about its pecuniary success.

Now, as to the value of marketable mica. The general impression is that it is worth from \$2 to \$14 per pound, according to size of sheets. To show how sanguine people are on such subjects, we will take a few extracts from a prospectus of a new company recently formed in Colorado, the object of which is to mine for mica (after selling shares). The prospectus states that the quarries, which are 35 miles from railroad, are capable of supplying, with a few men, one ton of clear-cut sheet mica per week, which will sell readily at an average of \$5 per pound, or \$10,000 per ton. To produce this ton of mica and prepare it for market, counting one ton per week, the expenses are estimated as follows: Salaries of superintendent, two foremen, eight skilled miners, and eight strippers and sorters, \$562 per week; packing department, \$100 per week; hoisting and freight department, \$685; and headquarters expense, \$87; total, \$1,434 per week. The ton of clear-cut mica in 10-pound boxes is produced, therefore, at a cost of \$1,434, leaving a net profit to the company of \$8,566 for every ton produced, or a grand annual profit of \$445,432, or 85% of the capital stock, in the sale of a ton of mica per week. This shows pretty good figuring, and we apprehend that even at the large cost of production estimated, if anybody could get anything like one-quarter the estimated profit here, most of our miners would quit working for gold or silver and open up a few of the mica mines which are lying around loose in different sections of the country.

To start this little mint only \$25,000 are required, to put up machinery and buildings—and two weeks' work will pay it back. The only thing queer is that they don't hold on to those shares themselves, and get out a few tons on a small scale, so as to make the mica pay for the improvements. The "mine" is described as having "an open cut 18 feet high, and one adit driven into the mountain on the quarry about 16 feet. Both have been worked at great expense, owing to the former high price of provisions and great scarcity of labor." This sounds funny to any mining man, especially about the 16-foot adit and the scarcity of labor. A sick Chinaman could dig that far in, with proper tools, in a few weeks.

We mention this incidentally to show that

the impression is abroad that mica is a very valuable and rare substance. A price such as several dollars, or even one dollar per pound, except for large pieces of first-class character, is out of the question. At Breslau, Prussia, an important industrial center, one house devotes itself exclusively to manufacturing articles from mica. This house cannot buy the American article, but now purchases elsewhere, because the price here was too high. As for merchantable mica, even of the best quality, the waste in working it at a factory is from 33% to 75%, and the wastage is not worth a dollar a hundred weight. The price paid by the house referred to is 14 cents to 75 cents per pound. In this city there are no purchasers at all, and we know of no one on the coast who deals in the article.

In preparing samples the pieces should be left in their natural shape, not trimmed or squared up, but just as it comes from the mine. Mica of good quality has the following characteristics: If the top layer, generally stained with foreign substances, be removed, the ore beneath, when split off, should be of crystal-like transparency, while the body of the piece, in all its thickness, should show a reddish hue, with a very smooth surface. To the touch it must feel hard; soft mica, though ever so transparent, does not serve for manufacturing purposes. Finally, the layers, when separated, should be free from flaws or air bubble. Small pieces, two to five inches square, amount to very little in a commercial view. We have seen perfectly pure, clean sheets, 10 to 16 inches, taken from a mine on this coast; and although it was first class in every respect, the mica could not be sold here at any price, there being no demand at all for it on this coast. If the new toughened glass supersedes mica, as seems likely, for it answers about the same purposes, mica would be of no value whatever, except for scientific matters, so that it would not pay to mine it at all.

## Telephones in Mines.

We notice that a telephone has been successfully introduced in England for communication between the workings of a Cornwall mine and the surface, thus superceding the old-fashioned cord signals. It is probable that before long this latest achievement of science will find recognition in all large mines, and that telephones will be as common as bells and cords are now.

A great advantage of this new means of communication is that a valuable saving of time will be gained and work rendered much more convenient. It will not be necessary to send some one up to communicate any orders or requests out of the ordinary line; and those on the surface may issue directions at any time without going or sending down the mine. In case of apprehended danger, no time need be lost in communicating from either direction such instructions as are necessary.

As far as we have heard, no attempt has been made to place the telephone in any of our large mines on this coast, but it always takes a little time to introduce any new thing of this kind. There may be some apprehended difficulties or inconveniences in the practical use of telephones in mines, but if one superintendent will demonstrate among us that it is a useful appliance, all the others will shortly follow.

MR. HENRY SEWELL, M. E., who has been in Chile for the past two years, has returned to this coast via London, to take charge of the interests of certain English mining companies here. Mr. Sewell, who was formerly an occasional correspondent of the Press, has been an advocate of American mining interests in England, and will be remembered as having written a pamphlet on the Emma mine and its management. He advocated in England the purchase of the Flagstaff mine at \$60,000, which was afterwards bought at \$1,500,000; the Yosemite mine, at Utah, for \$75,000, which afterwards mined out \$300,000; and the "No You Don't" or Telegraph mine for \$20,000, which has produced some \$500,000. Probably had the mines been bought at the bedrock prices stated, the English would have realized more than they have. Mr. Sewell's familiarity with matters on this coast will be of advantage to him and to his companies, and it is to be hoped he will be able to bring them out of financial difficulty. Mr. Sewell has brought with him from Chile a very fine and interesting collection of silver ores from the limestone formations in Chile, Peru and Bolivia, such as have never been seen here before. They are now on exhibition at Riotte & Fernbach's, 303 Montgomery street, where they will be for a short time. He has also brought some samples from the gold diggings at Catapilco. Mr. Sewell promises us some notes on railroad and mining matters in Chile.

**SIERRA COUNTY MINES.**—The Pliocene company, at Galloway Hill, are now down near 250 feet, with their boring machine in swelling bedrock, and are so much encouraged with the favorable indications of the existence of a rich gravel channel that they have decided to sink a shaft immediately. A 900-horse-power engine has been ordered from San Francisco, and a contract let for 500 cords of wood. The swelling bedrock is so difficult to run through that further progress with the boring machine will necessarily be slow until this impediment is removed.

## The Hayden Survey.

We had the pleasure, this week, of a conversation with Mr. A. D. Wilson, of Prof. Hayden's United States Geological Survey, who has just come in from the field. He has made a short visit in Oakland before going on to Washington to prepare his report. Mr. Wilson was formerly connected with the California State Geological Survey, and was also one of the party with Clarence King when the "Arizona diamond" exposure was made. He had been all over that part of the country where the diamonds were supposed to have been found, and went with Mr. King to the spot at the time of the exposure of the fraud. Mr. Wilson now has charge of the triangulation and topographical work of the Hayden Survey.

There have been four regular parties in the field this year. The scene of operations has been in the Wind river country, and then to Fort Hall, and from Rawlins to Ogden, and as far north as the National Park, Wyoming. About as little is known of this as any part of the country. No parties who have done any work have been through there since Fremont's, in 1842. Mr. Wilson's duties are to go ahead, lay out the bare points, etc., and the other parties come on afterwards and work up the details. The other three parties were under Mr. Becker, Mr. Gannett and Mr. Chittenden, all of whom have finished the season's work in the field, and are now on their way to Washington. They have been out about four months, and have accomplished considerable work during that time. There has been a geologist with each party, so that the topographical and geological work has been done at the same time.

In the Wind river country they saw some fine looking outcroppings; but no prospecting at all has been done in that section, as the presence of Indians prevented any mining work being done. The report on this section will embrace a general description of the country, with economic maps giving the location of grass, timber and agricultural lands. The survey next year will probably be continued in Wyoming until a complete survey of that Territory is made, the same as has been done in Colorado. This winter the maps of Colorado will be finished up. These will be in the form of an atlas, and will be on the scale of four miles to an inch. The maps show two degrees east and west, and a degree and a quarter north and south. There will be geological as well as topographical maps, probably the best ever made in the United States. The maps will be all colored, those on the geology in accordance with the geological formation. The newest State in the Union—Colorado—strange to say, is the best surveyed one of all, as, when these maps are finished, all the geological and topographical details will be shown in a manner far ahead of the surveys of any of the older States.

The Hayden survey has been performing very good work ever since it was started. Its distinguished chief is personally popular, as are the assistants, and he has succeeded in making the survey itself popular, so that there has been no difficulty in securing appropriations from Congress from year to year. The work accomplished is highly important, as giving information of sections of the United States almost entirely unknown. The general public seem to appreciate the efforts made in this direction, and there is little probability of the survey being discontinued. The reports are fresh, and written in a comprehensive manner, reflecting great credit on all concerned. While all matters of a scientific character are ably discussed and accurately described, the general matter is of a nature to be comprehended by all, and there is no pedantic attempt to confuse those for whom its reports are really intended—the people.

**THE FAIR DAILY.**—We are pleased to know that the *Mechanics' Fair Daily*, which was published by Dewey & Co. during the fair of the Mechanics' Institute, succeeded in winning many good opinions from the many patrons of the fair. On the part of the publishers we are glad to acknowledge that no small part of the popularity of the fair organ is due to the devoted labors of Mr. A. O. Carpenter, of Ukiah, Mendocino county, who managed the editorial department. Mr. Carpenter is a writer of ability, and is possessed of a dash of humor which gives spice and life to all his productions. At home he is a power in the life and in the business interests of his county; and we are pleased to assure his friends that he won new laurels during his latest sojourn in the city.

**PRISMALOID RAILROAD.**—Notwithstanding considerable opposition made to the proposed prismaloid railroad, the Board of Supervisors has given permission to have the road built. The order starts the road from Market and Valencia streets, "along and over such streets that are or may be opened and established for street purposes, up to the entrance of Golden Gate park; thence to the park and along the beach to the boundary line; thence back to the intersection of San Jose avenue and 26th street, over such streets as may be opened." The secrecy in reference to the route was based upon the statement that if it was known the people owning the lots would raise the price of their lots on the company.

We are indebted to Mr. E. K. Downer, of the *Mountain Messenger*, for some fresh mining items from the prolific hills of Sierra county. Mr. Downer has been in town visiting the fair,



### The Patent Office Fire.

A most disastrous conflagration occurred at Washington on Monday, by which many of the models and records of the United States Patent Office were destroyed and the Patent Office building very badly damaged. The fire broke out in the attic over the model room of the Patent Office, where a large number of rejected models were stored, and soon spread to the main hall, in which are ranged, in glass cases, thousands of accepted models upon which patents have been issued.

The flames soon licked through the attic and penetrated the main hall, which was filled with an abundance of combustible stuff. Row after row of glass cases with wooden frames, many of them filled with highly inflammable articles, were stored in this hall, on the floor and on the galleries which skirted the walls on either side. These soon caught and were speedily wrapped in flames, which greedily licked up the evidences of ingenuity so profusely exhibited here, while they at the same time devoured the roof, which, in a few minutes after the discovery of the fire, was in a blaze. All the engines in the District were promptly on the spot and were at once put into active operation. It was soon discovered, however, that the fire department of Washington would prove inadequate, even with the assistance of the engines from the Navy Yard and Arsenal to suppress the flames. Dispatches were accordingly sent about noon to Baltimore for aid, and, in less than an hour from their transmission, several engines from the monumental city were in service. The distance between Washington and Baltimore is 39 miles, and the special train which drew the engines traveled the entire distance at the average rate of a mile a minute. The firemen worked with a will, and labored industriously to save what property they could by moving it. A large force of marines from the Navy Yard and the marine barracks were on hand and formed a cordon around the building, and assisted the police in keeping back the immense crowd surrounding the building. Secretary Schurz, assisted by Mr. Bell, the Assistant Secretary, superintended the removal of the files and records, which was conducted by the clerical force under their direction.

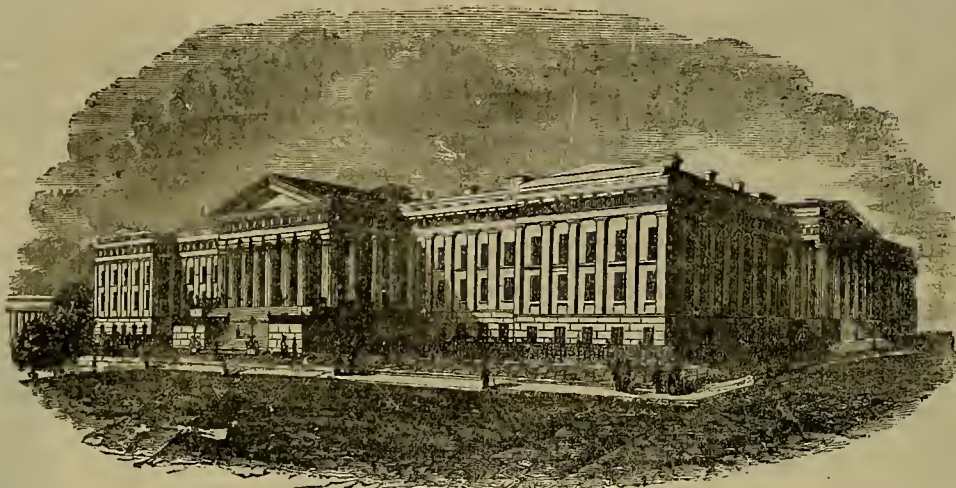
The Patent Office occupies the two blocks of land situated between Seventh and Ninth and F and G streets, and is 453 feet long and 331 feet wide, and 75 feet high. In it are the offices of the Secretary of the Interior, the Commissioner of Indian Affairs, the Commissioner of the General Land Office and the Commissioner of Patents. The original building was built of freestone and granite in the Doric style. Two wings of marble were added later, each of which equaled the dimensions of the main edifice. The principal entrance is on F street, directly opposite the General Postoffice, and presents a very commanding appearance. The building was considered the best specimen of this style in the country, as will be shown by the engraving shown on this page. The two lower stories and basement were used for the various offices of the different bureaus of the Interior Department enumerated above, and the large hall overhead was used for storing the models upon which patents were issued. This immense apartment, which extended around the vast building, had at least 75,000 models arranged for convenient reference, all classified and numbered and placed in cases. Nearly all of these have been destroyed, and many were badly damaged in being removed to places of safety. Efforts were made during the early stages of fire to save many valuable relics which were exhibited in the main hall of the model room.

The principal loss falls upon the Patent Office. The original copy of the Declaration of Independence and relics of General Washington were saved, as was also the Franklin printing press. Nearly all the specifications and original drawings of the Patent Office are safe, and from these models can be reproduced if necessary. None of the Land Office records have been destroyed by fire, but many were seriously damaged by water. The records of the application division of the office, which first receive applications from patentees, and of which papers no copies were made, were saved. The most valuable models saved were those relating to sewing machines, fire-arms, printing presses, locks, safes, etc. The models of reapers, mowers and various agricultural implements were destroyed. A temporary room will be erected at once. The damage to the building is variously estimated at \$300,000 to \$500,000, while that growing out of the destruction of models and other valuables belonging to the Patent Office is almost incalculable. The arches, which formed the ceiling of the second story, and upon which the floor of the third story rested, are so badly damaged by heat and water that many of them must be torn down. The marble of the outer walls is considerably discolored by the flames and cracked in many places. It is supposed the fire had been smoldering beneath the roof,

which was not fire-proof, for some hours before it was discovered. The total number of models destroyed is not accurately known. Many valuable documents are damaged by water, and considerable confusion will ensue from the mixing up of papers in the effort to save them from destruction. The value of property destroyed will aggregate about \$1,500,000; but as a large mass of models cannot and will not be replaced, the actual loss will probably not reach over \$800,000 or \$900,000. The Patent Office has to its credit with the Treasury, over and above its earnings, a sum sufficient to meet this expenditure, but it cannot be used without an appropriation by Congress. The cause of the fire is attributed to spontaneous combustion among a lot of non-patented chemical matters stored in the attic of the Ninth street front.

The casualty entails an irreparable loss to inventors, who are assisted by examining the models, grouped in classes, forming a bird's-eye view of the extent of inventions in a certain line, which can be minutely studied by those who have the time and interest to do so. The loss is something more than can be calculated in money, as the work of the brain and hand of every inventor forms a footprint, as it were, showing the progress of invention in America.

And yet drawings, probably of nearly every model, are intact in the Patent Office, and are more frequently used than the models by the examiners and other officers of the department in examining new applications. None of the European or older countries of the world now require models of invention, relying entirely on drawings. Therefore we are not so badly off now for models of inventions as other countries, even with so large a loss as the fire entailed. It is an extra precaution, rather, of the United States to require models, and prevents the probability of drawings being changed after apply-



PATENT OFFICE AT WASHINGTON, D. C., PARTIALLY DESTROYED BY FIRE.

ing for a patent, whereby the claims of patent owners could be afterwards extended, as the drawings are not allowed to show more than the models, of which they are a true representation. The full specifications and drawings of all patents issued from 1870 to the present time have now been printed and issued in volumes, which are scattered over the country everywhere, preserving them beyond the possibility of a doubt from loss by fire. The loss of the rejected models will not prove so serious to the Patent Office business and convenience of inventors as was supposed. The Supreme Court of the District of Columbia decided, about a year ago, that rejected cases could not be given as references; therefore, these models were mere rubbish as far as the business of the Patent Office is concerned, and are little loss to the country. In fact, the Patent Office officials had been looking around for some time to see what disposition could be made of these rejected models, so as to give room for those which were useful. Their loss will perhaps be of benefit to the inventors, because these models being out of the way, the examiners will not be likely to be prejudiced by what they had seen in old, rejected cases in their examination of new applications. With "live" models it is, of course, different, for here the loss is irreparable. The business of the Patent Office will probably go forward with but little detention in most cases, so that inventors need not hesitate about applying for patents on account of the fire. Pacific coast inventors will have their interests looked closely to as our agents in Washington will exercise extra precautions in pushing ahead applications at the present time. Since removing to our new offices at 202 Sansome street, our facilities for transacting patent business are improved, and the fire in Washington need not delay at all the applications sent on.

The fire in the Patent Office in 1836 was doubtless a more serious loss, as there were very few publications of the Patent Office reports, and they had a less complete system of drawings, etc. The main description of many patents issued was lost entirely to the Government. The attempt to get parties holding patents to return them to the Government officials for copying was a failure, as comparatively few complied with the request.

THE Mayor of Fernandina, Florida, asks contributions in money and supplies for the relief of sufferers from yellow fever.

### Alpine County and its Mines.

[Written for the Press.]

#### A Mountainous Country Aply Named.

While Alpine county belongs politically to California, its position and topography make it a part of the great Utah basin, and, in this sense, attach it to the State of Nevada. In view of this fact, the people of Nevada, while it was still under a Territorial form of government, made strenuous but unsuccessful efforts to induce California to relinquish this strip of country to them. The county has been aptly named, being wholly Alpine in its position and external aspects. While its westerly half occupies the summit and slope of the Sierra Nevada, here precipitous and lofty, its easterly is covered by an outlying spur of that range called Silver mountain, the two being connected by a serrated ridge stretching east and west across the southerly border of the county. These several elevations, with some rugged hills and many deep canyons, make up almost the whole area of the county, very little of which lies at a lower level than 5,000 feet, while portions reach an altitude of more than 13,000. Approached from the north, and seen as far off as Virginia City, nearly 100 miles away, this cross range presents a perfectly castellated outline, very picturesque and striking, while Silver mountain lifts itself to a height of 11,000 feet on the one hand and the Sierra to a much greater height on the other; both being

nounced, some would be found adequate to their successful treatment. While the most of the money required for prosecuting these enterprises came from the Atlantic States and Europe, the people of California and Nevada contributed largely toward the earlier improvements made in this region. Of the primitive stock of miners many toiled for several years and then left without receiving anything for their labor or money expended. So, too, the capital advanced by Californians for constructing the first roads, building towns and furnishing merchandise and other supplies, was about all lost. Still, there is no doubt but these Eastern investors have, first and last, sunk more money over in Alpine than has been lost by our own people.

#### In Regard to These Foreign Companies,

The following synopsis of their operations and affairs will convey some idea of the amount of money they have expended in these Alpine county mines and how they are likely to come out in the end; only the leading companies, or such as had out considerable sums, being included in this enumeration:

The Schneetady, a New York company, incorporated in that State in 1871, expended for a 20-stamp mill, erected that year, \$80,000, and, in the purchase and development of their mine, the Tarshish, an additional sum of about \$100,000—say, altogether, \$200,000. This property is situated near the town of Monitor, the location being one of the earliest made in that district. Two tunnels have been driven to the lode, the upper intersecting it at a length of 450 feet and the lower at a length of 900 feet, the two being connected by an incline 225 feet deep. From this incline various drifts have been carried both north and south, cutting numerous small clayey pockets carrying black sulphides of fair quality. From one of these drifts ore of this kind, to the value of \$10,000, has been extracted. From the upper works some 2,000 tons of \$30 ore have been taken, the most of which remains at the mine. For roasting their ores, the company put up one of White's revolving furnaces. After a trial upon 300 tons its further use was dispensed with, the chlorination not exceeding 47% of the assay value of the ore. Having tried wet and dry crushing and failing with both, as well as in their attempt to desulphurize and chloridize their ores, the company shut down their works in 1873, and have done but little since. The property is in good condition and pretty well explored, and could, no doubt, be operated with profit, could means be supplied for cheaply and thoroughly beneficiating the ores.

#### The Exchequer Mine

Is situated on Scandinavian canyon, Silver Mountain district, at an elevation of 1,300 feet above the adjacent valley. It is the property of an English company, who purchased it some six or eight years ago, and have since expended a good deal of money upon it. Their head-quarters are in London, and the company is said to have a paid-up capital of \$500,000. If this is the case their expenditures must have been much larger than is generally supposed, or else the price paid for their mine must have been out of all proportion to its value, inasmuch as the *Exchequer* here seems to be in a rather impecunious condition, while the *exchequer* at home, judging from remarks made at a late meeting of the shareholders, is by no means plethoric of funds. The company own 6,800 linear feet on three parallel lodes, of which the Buckeye is the principal. On this a thousand feet of tunneling, with as much drifting, or perhaps more, has been run. The mine is also opened by a vertical shaft, some 500 feet deep, over which are placed steam hoisting works, with capacity to do the requisite lifting and pumping to the depth of 1,000 feet or more. On Silver creek, one and a half miles from the mine, they have a first-class, 18-stamp steam mill, with an O'Hara furnace attached, having a capacity to roast 30 tons daily. Adjoining these works is a water-driven sawmill, at which the company make their own lumber, and much, also, for sale—a 760-acre tract of woodland near their mine affording ample supplies of timber. From their mine a good wagon road has been built down the mountain, over which fuel, timber and ore are brought down, and supplies taken up.

The most of the work done and the improvements made appear to have been executed in a careful and substantial manner, but with how much economy I am unable to say, though it is probable that there have been expended upon the entire property at least \$200,000. In the principal vein opened several small ore bodies have been encountered, and a considerable quantity of ore brought to the surface. But it seems to have been impossible to work it with any degree of closeness, notwithstanding the Superintendent reports the O'Hara furnace as answering a good purpose. But the fact appears to be that Manager Chalmers had, in some unaccountable way, greatly overestimated the value of the ores taken out; and which he had led the company at home to believe would average some \$60 or \$80 per ton, whereas numerous assays made by Prof. Price, who not long since visited and examined the mine, establish that they will not average over \$5 or \$6. Three hundred tons of selected ore were found by him to yield

(Continued on page 204.)

covered with snow for seven months in the year, some of which is retained on their northerly slopes all summer.

So upheaved and eroded, the observant prospector marked this as a

#### Fit Region for Mines

At an early day; these hardy adventurers having entered the deep canyons and scaled the steep hills of Alpine in search of silver-bearing lodes in the spring of 1861. And they were not disappointed in finding here abundant indications of the precious metals. Running across the country in a generally north and south direction, there can be traced a metalliferous belt, composed mainly of hornblende, or syenitic porphyry. This belt, which is some three miles wide, carries a great number of quartz ledges, the most of them running with its course and varying from one to twenty feet in width. Some of these lodes show an enormous outcrop, with other indications of strength, many of them being also well defined and of great surface continuity. As a general thing, such of them as have been much opened seem to go down between well-formed walls, smooth and tolerably regular. These good features, with a fair showing of low and occasionally pretty rich ore in the croppings and upper workings, lead to the belief that in due time profitable mines would here be opened.

But Things Failed to Turn Out as the Miners Hoped for.

In some instances the streaks of ore found on top failed to hold downward, and when they did there was not that improvement in grade or bulk that had been expected. And when deposits, otherwise satisfactory, were opened up, the ores proved intractable to the Washoe process, which was first introduced, nor would they yield readily to other and more costly methods when these were substituted for the first adopted. These troubles began at an early period in the history of these mines, causing many of the original locators and claim-holders to abandon their interests and leave the district. Before these difficulties had developed themselves strongly, however, many companies had been formed and much capital invested in the purchase and opening up of the mines, the erection of mills, etc., these investments having been made under the impression that the ores would become more docile and otherwise improve at greater depths. It was also supposed that, of the many processes then being an-



## Custom Mills.

Mr. C. Berger, the Superintendent of the San Francisco copper mining company, at Spenceville, thinks that one great drawback to the development of mines in this country results from the fact that mine owners all want to reduce their own ores. As soon as the prospector finds a ledge that will pay, he at once makes arrangements for the erection of a quartz mill. From want of experience, or knowledge of working ores, he wastes about half the gold in the rock; and the result generally is that his mine fails to pay, and he at last reluctantly is compelled to shut it down. That this is the experience of a large proportion of miners there is no doubt. Mr. Berger thinks the reduction of ores in one district ought to be done by one or two companies; that the miner should attend only to mining, and be able to sell his ores to reduction companies at prices better than he can obtain by the present modes of working. He thinks that reduction companies with ample capital could adopt all the best improved methods of working ores, and by employing none but the most experienced workmen they could save a much larger percentage of gold than is now done and thereby be able to pay the miner more than he at present receives; besides, it would save miners the expense of erecting mills and blindly experimenting with them. We are inclined to believe the idea is a correct one. A man may be a good miner and not know anything about reducing ores. It does not follow that the owner of a mine should reduce his own rock more than that a farmer who raises wheat should erect a grist mill to make it up into flour. If a large reduction company should be organized in this district, and could purchase all the ores of the district at the mines at a fair valuation, it would be the means of opening dozens of ledges now unworked because the owners are unable to erect machinery. Such a company could erect mills wherever needed, and by employing scientific men and using the latest improvements, could save much of the gold that now goes to waste and does no one good. The idea looks feasible to us. The owner of sheep clips his wool and it is taken to the woolen mill to be made into cloth. The producer of wheat takes his crop to the custom mill to be made into flour. The cotton producer sends his bales to the mill for manufacture, and why should not the miner send his ore to the mill to be worked? Rock would then go through the hands of men who make a specialty of reducing. It could be scientifically tested before being worked. By such means improvements would soon be made that would save to the world a great waste now going on wherever mining is prosecuted.—*Nev. Gazette.*

**THE ACTION OF OILS ON COPPER.**—In a paper before the British Association, "On the Action of Various Fatty Oils upon Copper," Wm. H. Watson, F. C. S., gave in detail a number of experiments, showing the extent of which 10 different oils act upon copper. The result of the experiments seemed to show that paraffine and castor have the least action upon copper, and that the action of sperm oil and seal oil is slight. Linseed, almond, olive, sesame, neatfoot and colza produced considerable action upon copper, linseed oil being most active. The author concluded, from his experiments, that the comparative action of different oils cannot be correctly decided in all cases simply from the appearance of the oils after exposure to copper plates, though minute quantities of the metal might be easily detected in most oils from the color which is produced by such exposure. An associate expressed gratification at the results of Mr. Watson's experiments, as they confirmed the results of his own. He felt that he should be quite competent, with the aid of what he had now learned, to do that which he had long been attempting—to bring to a higher state of perfection oils for the purpose of lubrication.

**ENGLISH ROADS.**—The English, at all events, says a letter-writer, know how to make roads. Their wood pavements are magnificent. London has set the fashion of wood, and Liverpool is beginning to follow it; but there are no pavements in the States to touch these wooden roads of England. They are laid on foundations which in some cases have been solidifying since the days of the Romans. On these foundations they lay macadam and cement several feet deep, and then come blocks of pine, laid with mosaic-like accuracy. There is a piece of wood pavement of this kind in Oxford street, London, which has not been repaired for over two years, and it looks as substantial and perfect as when it was first laid down. The average price of this kind of pavement is about \$4 per square yard, and the companies keep it in order for two years without charge, and then guarantee it for 15 years at an annual charge of 25 cents per square yard for maintenance, which enables the pavers to relay the road, if necessary, after eight or ten years.

**RECLAMATION OF THE ZUYDER ZEE.**—Active preparations are going on for the commencement of the long-projected work of draining the Zuyder Zee. A dam nearly 25 miles long is to be carried across the gulf, and upon this pumping machines of 10,000 horse-power are to be placed, capable of discharging 6,500,000 cubic meters of water daily from the inclosed sea. It is estimated that the work will occupy 16 years, and that it will cost 335,000,000 francs. The scheme, if completed, will form one of the greatest engineering feats of the world.—*Engineering News.*

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Remittances of money, made by individual inventors to the Government, sometimes miscarry, and it has repeatedly happened that applicants have not only lost their money, but their inventions also, from this cause and consequent delay. We hold ourselves responsible for all fees entrusted to our agency.

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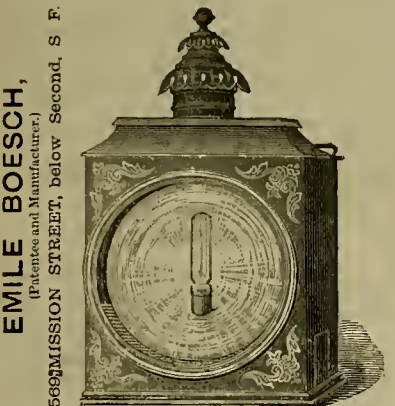
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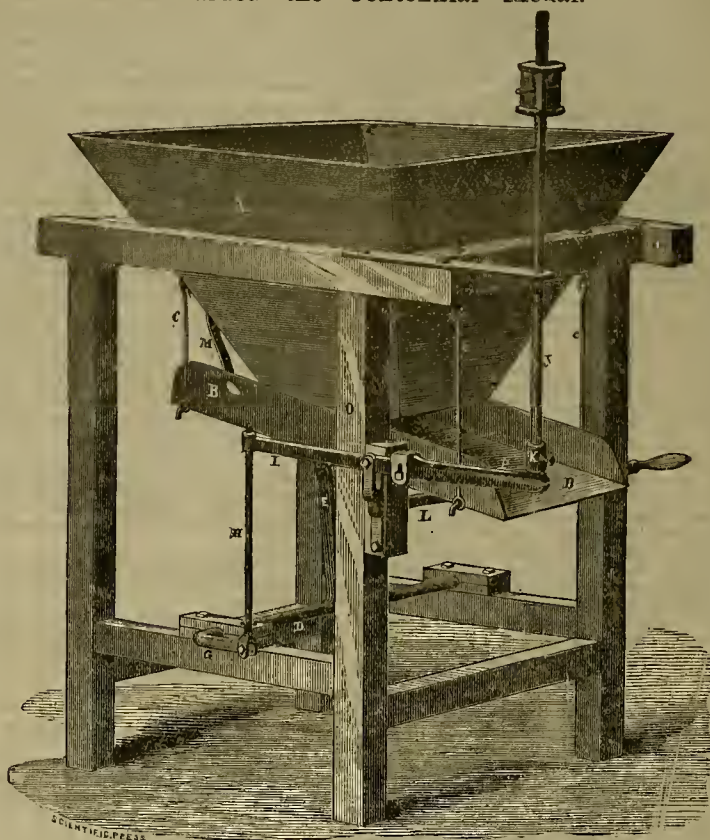
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say, that in my opinion, the Tulloch is much the best machine; it will feed any ore that can be fed by machinery;  
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Continued from Page 201.

only at the rate of \$7 per ton, and 800 tons collected at the mill only at the rate of \$5.50 per ton. Prof. Price also gave it as his opinion that if any permanent bodies of fair grade ore were ever found in this mine they would be reached only by very deep exploration. These facts, when they came to be known, created no little consternation among the shareholders in London, who had been led to believe, during a period of several years, that they were all the while on the eve of a great success. Some of the shareholders, in their severe disappointment, have sought to criticize Prof. Price and his report, although the majority of them have accepted his conclusions with thankfulness and approval, satisfied that he has performed the service assigned him honestly and intelligently, as everybody on this side will readily believe.

## The I. X. L.

Lying a little below the Exchequer, on a parallel lode, belongs also to an incorporated English company, having a paid-up capital of \$500,000. They came into possession of the mine several years ago, previous to which it had been explored by means of two tunnels run to the ledge, one being 500 and the other 1,000 feet long. As much as \$50,000 or \$60,000 worth of ore was drifted out and milled by the original owners. In 1872 the company put down a shaft to the depth of 200 feet, after which work was suspended for two years, when steam hoisting works were put up and sinking resumed. Latterly the mine has been under the management of Lewis Chalmers, Superintendent of the Exchequer, who has cleaned out the underground works, and put the whole mine in good shape for further active operations. The company own a good mill site with water power convenient to their mine, but no mill has yet been erected. The ore bodies and general appearance of the lode, so far as opened up, are much like those in the Exchequer, similar difficulties having also been encountered in reducing the ores.

## More of the Same Sort.

The Imperial, of London, also an English company, organized some five or six years since, own 10,000 feet on a series of parallel lodes in the Monitor district, on which they have driven a double-track tunnel a distance of 1,400 feet, cutting the first ledge in their series at a depth of 600 feet. This done, they ceased operations in order to await results in other tunnels being run for the same set of veins. As nothing determinate has been affected in these tunnels, this company are presumably still holding on, and it is more than likely they will continue in this condition of suspended animation for an indefinite period to come. Their expenditures have not been less than \$100,000, and may have been twice that amount. The history of the Mount Bullion company, another English institution, is not very different from that just recited. They, too, have a series of lodes which they have cut with a 2300-foot tunnel, have a mill with other appearances, and must have spent here \$100,000 independent of the purchase price of their mines.

## Among Other Mines Owned in the Eastern States

That have already cost the present owners large sums with no prospect of early returns, are the Monitor and Northwest, a Milwaukee company, who have a fine mill and a long tunnel—out, perhaps, \$200,000 on this property, and \$50,000 on the Silver Glance, another claim owned by them in the same vicinity; the Pittsburg, of Pennsylvania, out \$35,000; the Globe, for several years under the management of General Winchester, out, say \$100,000; the Advance, a live property with fair prospects; and some half dozen others that, after spending from \$10,000 to \$20,000 each, may now be considered defunct.

## Of Home Companies,

That is, those belonging to Nevada or California, the most of them incorporated, there are some 15 which have made an outlay ranging from \$20,000 to \$50,000, a good share of it consisting of labor expended. Prominent among these are the Mountaineer, George Washington, Pennsylvania, Lady Franklin, the Nohle, now the California, the Morning Star, etc., all of which have done a considerable amount of exploratory work, but upon very few of which anything is now being done.

**A CONTEST FOR MINING BOOKS.**—Thomas E. Atkinson, charged with the embezzlement of the books of the Howe Silver mining company, of which he was Secretary, was dismissed in the City Criminal Court on Monday. When the case was dismissed the complainants—that is, the company—attempted to seize the books under a Sheriff's order; but one of Atkinson's friends seized them and cleared out of the court, closely chased by Capt. Humphreys, Deputy Sheriff, who came up with him on Jackson street and took possession of the volumes, carrying them off in triumph. The defendant claimed that the present Board of Directors of the company had been illegally elected, and that he had a right to hold the books. The Sheriff's officer acted under a writ of replevin. The books are now in the possession of the Sheriff.

**NEW STEAM TUG.**—The Board of Harbor Commissioners advertise that proposals will be received for the hull and machinery of a new steam tug, to be used in connection with the new steam dredger, now in process of construction. On this tug will be placed one of the most improved fire engines, for protection to the water front.

## Award of Premiums at the Mechanics' Fair.

The Twelfth Industrial Exhibition under the auspices of the Mechanics' Institute, closed on Saturday, the 22d inst., after a most successful season. President Hallidie made a brief address, in which he said that the managers had good reason to congratulate themselves upon the success of the exhibition. On the 7th of August the fair was opened with an indebtedness of about \$22,000, and the doors would then be closed with the whole debt wiped out, and the vast building fully equipped with all the requirements for an industrial exhibition, including steam engine, boilers, etc., all paid for. The receipts from tickets and admissions had been \$53,997.44, and from privileges \$3,904.50, making a total of \$57,901.94. The total disbursements amounted to \$40,528.56, while the loans for construction of the building and street improvements repaid were \$10,919.25, and the taxes on property \$5,886.25. After paying off everything the balance in hand was \$567.88. Mr. Hallidie, in conclusion, said that the Superintendent and Secretary had been untiring and zealous, and by their care and good judgment had added much to the success of the exhibition.

We append a corrected list of all the awards, so far as made public up to this writing (Thursday night). The additional awards we will publish in our next issue, as the list will then be complete.

**CLASS 3.**—Dennis, Richardson & Co., tuyers, Lloyds' patent; California Bellows Factory, California bellows.

**CLASS 4.**—Emery saw-gummers, A. Potter; foot-power machines, Osborn & Alexander; hub-boring and hub-mortising machine, Meeker, James & Co.; foot-lathe, C. T. Marwedel; A. Potter, sand-papering machine; J. H. Small, planing machine; Pacific Saw Manufacturing Co.; best display saws; N. W. Spaulding, inserted teeth for saws; H. C. Root, saw set and clamp; F. A. Huntington, shingle machine.

**CLASS 6.**—Mining Machinery and Appliances—Kustel & Hoffman, amalgamator; J. Hendy, cam and shaft, Cochran's patent; J. Hendy, (\$1,000 challenge) ore feeder; J. W. Quick, ore screens; Prescott, Scott & Co., best general display of mining machinery.

**CLASS 7.**—Low & Chartrey, washing machines.

**CLASS 9.**—Hall Bros., schooner model; Etna Iron Works, iron propeller.

**CLASS 11.**—Excavators, Price Press Company; gopher traps, R. E. Wood, Santa Cruz; Buckeye mower and reaper, sulky wire rake and separator (gold medal), M. C. Hawley & Co.; gang plow, Sweepstake Plow Co.; lawn mower, J. E. Gordon & Co.

**CLASS 13.**—Cooking, Heating and Ventilating—Holbrook, Merrill & Co., stove, the "Bismarck," copper and japanned ware; W. W. Montague, Van's French iron range; J. B. Stetson, best general display tinware, oil tank; Williams & Howse, oil stove; Wm. Rennie, Boynton's tile parlor stove.

**CLASS 14.**—Bronzed hardware, Dunham, Carigan & Co.; firearms and fishing-tackle, Liddle & Kaeding; display of hardware, Huntington, Hopkins & Co.; display of carpenter tools, Stanley Rule and Level Co.; mining and blacksmith tools, Ahner Doble; tuning arrangement, Blackmar & Davis.

**CLASS 16.**—Will & Finck, best cutlery; W. F. Palmer, edged tools.

**CLASS 17.**—Atlantic Bottling Co., device for closing bottles; J. Brownell, chimney flues; Carlton Newman, boxed and covered demijohns; Pacific Glass Works, California manufactured glassware; Eureka Mantle Works, finest display marbleized iron mantles; John Daniels, marble mantles; E. L. Ransome, best specimen artificial stone; J. B. Owens, ironstone pipe; Snook Bros., ornamental artificial stone pavements; California Pottery Works, terra cotta work; W. Jones, encaustic tile; Grates and mantels—Yost & Van Leave, mantels of California onyx.

**CLASS 18.**—Brass works, gas and lamp fixtures, etc.—W. T. Garvatt, brass goods and bells; G. W. Snook, water filters; G. Simmonds, Simmonds' night lamp; Emile Boesch, reflectors and metal spinning.

**CLASS 19.**—Woodward's Gardens, specimens natural history; Blunt & Chapman, best specimens taxidermy; Joseph Newman, exhibit of silk worms and cocoons; Emerson, Corville & Co., best canned California salmon; Falkner, Bell & Co., best display of wool; Oregon & California Railroad Company, best display of grains; San Francisco Journal of Commerce, best display of products of California; Dr. Fraser, Nevada, sulphur; Specimens of gold, silver, and galena ores, Kinsey Lammis; mineral illuminating oil, California Star Oil Works; California pumice stone, Whittier, Fuller & Company.

**CLASS 20.**—B. H. Freeman & Co., display of stair work; B. Nathan & Co., general display of fancy and housekeepers' goods; Whittier, Fuller & Co., best mirrors; John Mallon, best ornamental and bent glass; R. K. Brehm, wood turning; Davis Bros., fancy carved brackets and frames; Louis Dampf, passe partouts.

**CLASS 21.**—Musical instruments—Kohler, Chase & Co., wind instruments; W. R. West, banjo, California manufacture; Paillard & Co., music boxes.

**CLASS 22.**—Vehicles and their attachments, etc.—Carriages, Kimball Manufacturing Company;

hacks, B. Graves & Co.; double buggy, Larkin & Co.; single buggy, Kimball Manufacturing Company; open buggy, Larkin & Co.; sulky, Larkin & Co.; child's carriage, Hamilton & Lawrence; carriage goods and hardware, Meeker, James & Co.; swing in operation, Hartman & Freese; hearse, T. S. Eastman; wagon and carriage wheels, Waterhouse & Lester.

**CLASS 23.**—L. & E. Emanuel, furniture, grand display; California Furniture Company, parlor and bedroom sets; West Coast Furniture Company, dining-room set, spring mattress; C. M. Plum & Co., easy chair, window drapery; Heywood Bros. & Co., assortment of chairs; Gilhert & Moore, school furniture; J. B. Luch-singer & Son, office desk, sideboard; R. E. Campbell, best mattress, spring and hospital bed; Wakefield Rattan Company, rattan furniture; California Spring Bed and Mattress Company, Crandall spring bed.

**CLASS 24.**—Billiard Tables—Jacob Strahle & Co., billiard tables.

**CLASS 25.**—Woodenware, etc.—Rutherford & Mitchell, automatic reacher; E. A. Stockton, step ladders; West Coast Furniture Company, best baskets; Jacob Unna, feather dusters and brooms; Figer Bros., brushes; Whittier, Fuller & Co., varnish brushes; W. W. Montague, metallic refrigerator.

**CLASS 26.**—W. A. Hephurn, arena; J. B. Dexter, bon-bons; J. Vogely & Brother, candy; Warren Cranston, Limburger and Swiss cheese; W. T. Coleman & Co., chocolate, cocoa and arena; Sweitzer & De Long, cider and vinegar; A. P. Adams, compressed coffee; San Francisco Produce Exchange, cornmeal; W. A. Hephurn, condensed milk; T. A. Gerry, preserved oranges; C. Pizalla, Italian and French sausages.

**CLASS 27.**—Display of California wines, Lang & Co.; sparkling wines, Landsberger & Co.; white wines, "Pearl Hock," sweet wine and port wine, H. Palmer, agent.

**CLASS 28.**—T. G. Cockrill & Co., whisky; Cheney, Souther & Co., wild cherry bitters; McMillen & Kester, green ginger brandy; L. Hess, bitters; H. A. Chalvin & Co., cordials; Boca Brewery Co., lager beer.

**CLASS 30.**—Display of toilet soaps, McKeone, Van Haagen & Co.; display of staple soaps and perfumery, Colgate & Co., New York; display of ammoniacal compounds, S. F. Gaslight Co.; yeast powder, Bowen Bros.; blacking, Henry Leake; soda water, Geo. C. Thompson; flavoring extracts, S. H. Nicholson; giant powder, Giant Powder Co.; display of artists' materials, glue, and assortment of paints ground in oil, Whittier, Fuller & Co.; varnishes, and Valentine's coach varnishes, Heuter Bros.

**CLASS 31.**—P. Kelly, boots and shoes; Main & Winchester, harness and saddlery; H. N. Cook, leather belting; E. P. Danforth, upper, sole and harness leather.

**CLASS 32.**—Best display of printing and wrapping paper, S. P. Taylor & Co.; paper manufactured from the "Yucca Draconis," Walker & Co.; gloves and gauntlets, Mills & Leak; best display of cordage, S. F. Cordage Company; Eureka hair, J. Herzog.

**CLASS 33.**—Woolens, dress goods, carpets, etc.—Alexander McKay, cocoa matting, California manufacture; California Silk Manufacturing Company, sewing silk and twist.

**CLASS 34.**—Gentlemen's furnishing goods, etc.—Boys' and youths' clothing, Joseph Bros.; best made and fitting shirts, S. A. Kusel; best display of gentlemen's furnishing goods, P. Beamish; best California made gentlemen's clothing, Lancaster & Northon; gold embroidery, Norcross & Co.

**CLASS 35.**—Bustles and corsets, Lyman Alexander; dress-cutting rule, Mrs. E. Higham; artificial flowers, Miss Minnie Schwegass; point lace, Mrs. R. W. Hathaway; worked lace, Mrs. Eliza Gerrish; dress reform garments, Abby W. Baker; ladies' and children's underwear, M. Freud & Son; Ahhy W. Baker, health corsets; Mrs. Sonnichsen, curtain ornaments; Mrs. G. F. Walter, fancy Turkish dress; Miss Carrie L. Wood, millinery. Jafferis & Co., water-proof crape; Miss K. S. Cole, paper patterns.

**CLASS 36.**—Printing, lithography, etc.—Bancroft & Co., fine book-binding; T. G. Newberry, maps of San Francisco; J. T. White, jucattis papyrograph; J. S. Hopkins & Co., copying press; A. L. Bancroft & Co., label printing; Kerchoff & Specht, sunlight printing; Wells, Hopps & Co., metallic signs.

**CLASS 37.**—Jewelry, etc.—A. F. Rochicolo, galvanic plaster work; W. K. Vanderslice, quartz jewelry; R. M. Jackson, abalone shell jewelry; Middleton plate Company, plated ware; San Francisco Plating Works, silver plating and replated ware; Schultz & Fischer, best design and workmanship in solid silverware; Kohler & Ritter, best design and workmanship in gold; Teuhner & Hoffman, silver plated show cases.

**CLASS 38.**—Improved surveying instruments, John Roach; electric pen, C. J. Simmonds; combination beam for scales, Buffalo Scale Company; telegraph and electrical instruments, California Electric Power Company.

**CLASS 39.**—Surgical and Dental Instruments—Menz Spring, artificial limbs; J. S. & S. Russell, electric bands.

**CLASS 40.**—Handwork, needlework, etc.—Mrs. J. W. Souther, crocheted quilt and tidies; Miss C. Sweeney, silk treading; Miss McCloskey, best crocheted bed spread; Mrs. E. J. King, quilted quilt; Mrs. Beaman, braided mat; Miss L. Marks, best tatting bed set; Miss Mary Bucklin, best specimen tatting; Mlle. Mourgeanna, best embossed work; Mrs. C. Butler, turkey feather cuffs and collar; Mrs. Theresa Corlett, best wax flowers; Mrs. A. G. Nye, moss album and sea moss, skeleton leaves; Mrs. J. E. Carter, best wax fruit, best wax cross;

Madam Anna Getz Lucas, one best preserved ferns and pitcher plant, two best preserved Autumn leaves; Mrs. A. O. Cook, best chemically preserved flowers and moulding in wax; Mrs. H. Stettin, best embroidery, silk, linen, and chenille; Mrs. Letheby, ornamental leather work; Mrs. J. Sullivan, applique work on Turkish cloth; Shepard & Co., hair work; Mrs. Letheby, Oriental cloth; Wm. Cameron, stamping patterns; Mrs. H. W. Worth, hair wreath; Mrs. W. S. Ferguson, spice wreath; F. P. Medina, shell work; Mrs. A. J. Nealy, worsted work; Mrs. A. Townsend, air castle, Miss M. Langrehr, (aged seven years), paper flowers; Mrs. M. Elliott, best display of decalcomania; Mrs. A. Mangelberg, worsted embroidery; Display of embossed embroidery, Mrs. Koerner; patchwork quilt, Mrs. Bateson; crocheted catan table-cover, Minnie Kinsman; ostrich feathers, A. J. Balmy; embossed worsted embroidery, M. Dunn.

**CLASS 42.**—Carving, etc.—L. S. Schumann, meerschaut work; Samuel Kellett, plaster ornaments; Guido Kustel, galvanic plating; M. Doyle, bust of Father Burchard; Thos. Gagliardi, plaster busts; I. Grundel, amber work; Wm. Rennie, Boynton's tile parlor stoves; Yost Van Leave, mantels and California onyx.

**CLASS 43.**—Engravings, drawings, etc.—C. Deaves, poster wood engraving; J. E. Montenegro, best specimen of pencil drawing (original); Mrs. R. C. Springer, best crayon drawing; Wolf & Son, best architectural drawing, executed by Frank P. Burnham; F. Serigni, best original pen drawing; Geo. H. Miller best architectural drawing by an apprentice.

**CLASS 44.**—Plain photographs and photogate, an improvement in cameras, H. W. Vaughn; photograph in oil colors, F. Bouvy; photographs finished in crayons, A. S. Hossack; photograph background, W. R. Swazy; instantaneous photograph of racehorse "Occident," E. J. Muiy-bridge; photograph in water colors, I. W. Taber.

**CLASS 46.**—Fruits and Vegetables—J. Runyan, Sacramento river, display of peaches, \$20; H. K. Cummings, display of pears, \$20; Land Department of Oregon and California Railroad Company, display plums and prunes, \$10; R. B. Blower, display of grapes, \$20; Dr. J. Strentzel, display of oranges and lemons, \$20; W. H. Murray, semi-tropical fruits, \$25; General George Deitzler, dried fruit (Alden process) \$25; dried vegetables, (Alden process), \$15; R. B. Blower, best display of California raisins, (medal), \$25; R. J. Trumbull, best display of garden seeds; General John Bidwell, special display of new California products; San Francisco Journal of Commerce, best continuous display of fruit, \$100; best continuous display of vegetables, \$25.

## Complimentary.

E. K. Downer, writing up the Mechanics' fair for the Marysville Daily Appeal, notices our pavilion stand with the following remarks:

Dewey & Co., as usual in the past, publish the Fair Daily, and the press is running every afternoon and evening, and attracts much attention from people from the rural and mining districts. It is replete with advertisements and spicy articles relative to the exhibition and the general advancement of the industrial arts. This firm publishes two of the most instructive and interesting journals west of the Rocky mountains [MINING AND SCIENTIFIC PRESS and PACIFIC RURAL PRESS], both of which enjoy a world-wide circulation. It is a treat to visit their press, composing and editorial rooms on Clay street, and business office on Sansome street, and notice the strict order that prevailed everywhere among the employees, and the varied and complicated departments in which they are engaged, under the able supervision of Mr. A. T. Dewey, the business manager. The inventors who have gotten out patents through their patent agency attest to the accuracy and promptness of these gentlemen in attending to their business here and at Washington. At their stand is now displayed some fine specimens of California dates, grown in Sonoma county.

## SAVAGE MINING COMPANY VS. SUTRO TUNNEL.

A year ago the Savage mining company brought suit against the Sutro tunnel company in the Fifteenth District Court to rescind a certain agreement made, by which the defendant claims to have a lien on the plaintiff's mine, and to compel the defendant to execute a release of the agreement. A demurrer was interposed to the complaint, which was argued, submitted and overruled by Judge Dwinelle in September, 1876, and the case was then taken into the United States Circuit Court, under a motion to remit cause of action under the Act of Congress of 1875, granting to Sutro the right of way for the purpose of draining certain mining property on the Comstock. Judge Sawyer has decided that he has no jurisdiction in the case, and has remanded it back to the Fifteenth District Court for trial. There are 10 or 11 other mines interested in the success of the suit.

A RAILROAD train on the Canada Southern railroad run 111 miles in 109 minutes on the 14th inst. This is the fastest time in America, beating by three minutes the remarkable time of Vanderbilt's special train. The distance was between St. Thomas and Amherstburg.

WOODWARD'S GARDENS has the following new attractions: The buffalo chase; large whale skeleton; new museum; improvements in the zoological department, besides the other features which have made it popular.



(Continued from page 197.)

claim owned by Mr. Heckethorn. The specimen was a piece of gold, about two and a half inches long, little over an inch broad in the center, tapering down towards both ends, and about a third of an inch thick, weighing nine ounces. It is valued at \$125. The slight of this little specimen has completely cured us of the black hills fever, and we now have Osceola on the brain.

### TUSCARORA DISTRICT.

**PAOR, STEWART'S OPINION OF THE DISTRICT.**—Gold Hill News, Sept. 21: Although Tuscarora is the only free ore yielding district in Nevada outside of the Comstock, and although it bids fair to be in the near future a rival to the great mining zone at the base of Mount Davidson, yet fortune cannot be picked up at the new Dorado without the expenditure of much patience, hard work and hard cash. Impetuous persons should hesitate before making a blind rush to Tuscarora. Hundreds of men are flocking to the new camp from Idaho, Montana and Utah, as well as Eastern Nevada. Most of these men are in search of employment, and are usually penniless when they arrive at the camp. It is stupidly absurd to suppose that this class of adventurers can obtain work in a new silver-mining district. Already the town of Tuscarora is overstocked with poverty-stricken idlers, many of whom have not even a blanket to protect them from the sharp winds of Independence valley. Tuscarora is improving as rapidly as mechanics can build dwellings and shanties, but it is quite apparent that the present population cannot be assimilated before the winter season. The winter season in northern Elko county is usually severe, and lasts for seven or eight months. Men who are not prepared to meet these contingencies will act wisely by deferring their visit to Tuscarora till next April or May. To those who can raise means enough to build shanties and procure fuel and provisions for the winter, the present is a propitious time to locate at the great bonanza of the north, for in my judgment there are "millions in it."

### WARD DISTRICT.

**RICH ORE.**—Ploche Record, Sept. 22: We were shown on Tuesday last, by A. J. Blair, an assay of some ore taken by himself from the Ploche mine, situated in Ward. The ore was made by Hoffman, and showed \$5,774.57. The ore was taken from the depth of 160 feet, from a drift where the ledge had just been tapped at that depth. T. J. Bell is the principal owner of the mine. Mr. Blair having visited and reported on it at his request.

### WHITE PINE DISTRICT.

**A STRIKE IN THE JENNIE A.**—White Pine News, Sept. 22: We learn that an important strike was made a few days ago in the lower workings of the Jennie A. mine, which fully sets at rest the uncertainty under which the management has been laboring for some time in regard to a continuation and enlargement of the vein in the depth. Parties who have visited the mine since the late development was made express the opinion that the company have a very valuable property. The latest discovery of ore is all that prevents the immediate erection of reduction works by this company.

### Dakota.

**THE BLACK HILLS.**—New Northwest, Sept. 12: From Mr. Clagett we gathered a few items concerning the Black Hills country, when he left it a fortnight ago. The bulk of the population in the Black Hills is gathered in a parallelogram, 50 by 60 miles in extent. The present population is variously estimated at from 20,000 to 35,000 people. Mr. Clagett estimates it at 30,000. There are now some 30 quartz mills running. The gold is all free, except some white iron ore, which is run through an ordinary furnace, and then treated with cyanide of potassium. Only one stamp mill is set up and furnished with six months' supplies for \$5,000. Ore near the mills can be mined, hauled and treated for \$1.50 to \$2.00 per ton. The ore beds are comparatively inexhaustible, as \$3 and \$10 ore can be profitably handled, and it exists in enormous quantities. The character of the population is changing, the immigration of poor people falling off, and men of means coming in. He thinks it a good country for a reasonable population, but the vast majority of the immense throng who came last season were disappointed and returned or went north. Only one of the expeditions north found gold in paying quantities, and they were disappointed and driven in by Indians. Deadwood contains some 4,000 to 6,000 people. The majority are engaged in their own business, and are away up with people from other countries. Mr. Clagett is personally doing well and expects to remain in Deadwood.

### Idaho.

**RED WARRIOR DISTRICT.**—Cor. Idaho World, Sept. 21: In the Red Warrior district there are several good paying mines; among them the Governor Bennett mine, owned by Mr. Seoval, and the celebrated Avalanche mine, worked for years by John Thomas & Co. Recently Mr. Adam Gottsch purchased one-half interest in the mine for the sum of \$200 cash. The mine was worked 100 feet deep, showing a well-defined vein for 200 feet in length. There is a lower tunnel partly completed, to run this tunnel 50 feet further. They will tap the ledge 150 feet below the present level. They have sufficient quartz in sight to keep them working for years.

**ROCKY BAR.**—Here at the Bar times are assuming a rather dull appearance, not owing to any scarcity of rich and extensive mines, but owing to deficient capital to work them. We are situated so remote from railroads that moneyed men appear to shun the rich and extensive mines of Idaho, which will yet astonish the world. The Bonaparte mine is under the superintendency of Prof. Winn, and Mr. McKin, foreman. They have the mine opened up splendidly, showing a well-defined vein of from 20 inches to three feet of rock that will go from \$50 to \$150 per ton. They have the ledge opened and fully prospecting nearly 300 feet deep, and several hundred feet in length, showing \$1,000,000 worth of rock in sight. I am informed, on good authority, that the Monarch company's mine is looking better than ever. The Bleisoe company are down 80 feet and cross-cutting for the ledge. The Buffalo company shut down their mine for the present, not on account of any financial cause, but owing to having plenty of milling ore to keep their mill and furnaces running until next summer. The company have plenty of money to meet all demands.

**FOREIGN RAILROAD NOTES.**—It has been proposed in Germany to indicate all stations, to the public as well as the employees, by numbers, and to print on tickets, under the numbers indicating between which the passenger rides, the time the train is due at his destination, to prevent his being uneasy lest he may miss it. Thus, suppose New York to be station 1 and Philadelphia 15, and the train due at Philadelphia at 4 P. M., the face of the ticket would read: "1-15" (in very large figures), and underneath these figures: "4 P. M." The traveler, knowing he was not due till 4 P. M., would not be likely to begin to worry until near that time. Then it is claimed that station signs could be made much plainer by figures than by letters, because they could be very large, and on transparencies which could be illuminated and easily seen by travelers during the night.

**JOHN W. AMES,** son of Judge Ames, of the Supreme Court of Massachusetts, but now a resident of California, has been appointed Surveyor-General of this State.

### General News Items.

**URBAIN JEAN JOSEPH LEVERRIER,** the famous astronomer, is dead.

A \$10,000 fire occurred on Commercial street, in this city, on Monday evening.

**ELECTIONS for deputies in France** are ordered for the 14th of October, and the session of the Chamber of Deputies is called for November 7th.

A TELEGRAM received from an official source in Yeddo, says that the rebellion in Japan is ended. The chief of the rebels committed suicide on the 24th instant.

**PARTIES** behind the scenes declare that Tweed is not making a clean breast of it, or exposing any of his old friends who were in the ring that sympathize with him.

**THE death, at London,** is announced of Rev. Joseph Richey, of Baltimore, one of the leaders of the Ritualistic party in the Episcopal church of America.

**LARGE SUMS** of Canadian money have recently been stolen while passing through United States mails. A woman lately exchanged with a Chicago broker for American money, \$5,000 in Canadian bills, all of which turns out to have been lost in American mails.

A PLENTIFUL rain has fallen in many of the worst famine districts in India. Agricultural work is active and crops are making rapid progress. There can be no reasonable doubt that the tide of the great calamity has been turned, but vast numbers of those who survive actual famine must still succumb from their enfeebled condition.

**LETTERS** from Col. Corby, Secretary of the Sitting Bull Commission, says: We expect to reach the border by the 30th inst. Our latest advice is to the effect that his reclining majesty is enjoying himself quietly in Canada. Expect us in Washington early in November, perhaps as early as the latter part of October.

**THE official visitors to the West Point Military Academy** recommend that a commission be constituted to report such changes in the organization and course of study as shall promote its usefulness. Among the recommendations is one that inquiry be made as to the possibility of abolishing military parades on the Lord's day.

**PRIVATE efforts** have opened the way whereby applications for space at the French exhibition, next year, can be made and granted without waiting for the tardy action of Congress. Nearly 1,000 applications have been in charge of the United States Legation in Paris, which the French government would not consider because they were not supported by any official action on the part of our Government. This formality, however, the French authorities have consented to waive.

### New Incorporations.

The following companies have filed certificates of incorporations in the County Clerk's office, at San Francisco:

**PIRREURO G. M. Co.**—Sept. 21st. Location: Nevada. Capital stock, \$10,000,000. Directors—Henry Fisher, T. C. Lampe, J. H. Dinert, Jr., Frederick Engelken and Philip Kitz.  
**BELLE LAKE M. Co.**—Sept. 21st. Location: Elko county, Nevada. Directors—G. W. Grayson, Dwight Crittenden, M. Herman, Stephen Roberts and M. Dambith. Capital stock, \$10,000,000.  
**BREITERT O. M. Co.**—Sept. 21st. Location: Mono county, California. Directors—W. M. Lent, F. K. Bechtel, W. B. Carr, W. M. Stewart and B. B. Minor. Capital stock, \$6,000,000.  
**SOUTH SPRING M. Co.**—Sept. 21st. Location: Amador county, California. Directors—Benjamin Flint, John Tregloan, J. R. Tregloan, W. H. Reynolds and G. P. Thurston. Capital stock, \$6,000,000.  
**TIPTOP S. M. Co.**—Sept. 21st. Location: Arizona. Directors—P. F. Van Rensselaer, S. F. Gashwiler, E. O. De Crano, A. E. Head and Henry Janin. Capital stock, \$10,000,000.  
**AWONAUT M. Co.**—Sept. 22d. Location: Arizona. Directors—John F. Cassell, Henry H. Wood, Ira G. Hoitt, T. P. Palmer and Joseph Pentecost. Capital stock, \$3,000,000.  
**PAWNEE M. Co.**—Sept. 22d. Location: Nevada. Directors—S. Heydenfeldt, Delos Lake, Charles Allenberg, C. L. Perkins and James McMechan. Capital stock, \$10,000,000.  
**INDUSTRY G. & S. M. Co.**—Sept. 22d. Location: Nevada. Directors—Charles T. Behan, John E. Sisson, V. S. Eggleston, J. R. Brann and H. F. Whitman. Capital stock, \$10,000,000.  
**GOLDEN PRIZE M. Co.**—Sept. 24th. Location: Elko county, Nevada. Directors—J. B. Haggin, Wm. Norris, P. B. Cornwall, Robt. Sherwood and B. Holladay, Jr.

**MACHINE WORK IN SACRAMENTO.**—We learn, at the Union Foundry of Root, Neilson & Co., that the general run of work has been good this year, notwithstanding the dry season. They manufacture and repair a good deal of agricultural machinery, in addition to their mining, engine, steamboat and general machine work. This pioneer foundry keeps the lead in Sacramento, with a yearly increase of business. Lately the proprietors added to their large lot 35 feet more in frontage.

**COPPER.**—It has been found, in working the flue dust, that it carries a large percentage of copper. On being taken from the roasting furnaces and spread out on the cooling floor, it cakes and turns green from exposure to the air. On account of this fact no bluestone is used in the pans. The only base in the amalgam is this same copper, and in the lower grade it will run as high as 50%.—Eureka Sentinel.

**MORE valuable** than oil paintings, are the mammoth pictures produced by G. D. Morse at his emporium of photography, No. 417 Montgomery. They don't have to be varnished and worked over to preserve them.

### PATENTS AND INVENTIONS.

#### List of U. S. Patents Issued to Pacific Coast Inventors.

[FROM OFFICIAL REPORTS FOR THE MINING AND SCIENTIFIC PRESS, DEWEY & CO., PUBLISHERS AND U. S. AND FOREIGN PATENT AGENTS.]

By Special Dispatch from Washington, D. C.

WEEK ENDING SEPTEMBER 4TH, 1874.

**ROASTING ORES.**—Edmund Green and Abraham Halsey, N. F.  
**COVERS FOR LIQUID MEASURES.**—Charles C. Redmond, Santa Clara, Cal.  
**FLOATING BATH STRUCTURE.**—Francis Despol and Joseph Reboul, S. F.  
**ORE WASHER.**—Joseph S. Durcan, S. F.  
**DEED BOTTOMS.**—Bartholomew Essig, Sacramento, Cal.  
**FRUIT DRIERS.**—Wm. W. Ferguson.  
**BELTING.**—Herman Royer, S. F.  
**ROTARY FRISTING PRESS.**—Marshall Hahnke, S. F.  
**MOQUITO BARS.**—Margaret Patrie, Vallejo, Cal.  
**ELECTRO-MAGNETIC ALARM BELLS.**—Paul Seiles, S. F.  
**TRADEMARKS.**  
**STOMACH BITTERS.**—Eugene L. Bataux, S. F.  
**RAZORS.**—Natan Joseph, S. F.

WEEK ENDING SEPTEMBER 11TH, 1877.

**WATER CLOSETS.**—John R. Adams, Oakland, Cal.  
**GRAINING MACHINES.**—Wm. O'Day, S. F.  
**STONE LATHES.**—Frank Kessler, S. F.  
**CAR COUPLINGS.**—Wm. Lane, S. F.  
**PROJECTILES FOR SMOOTH-BORE CANNON.**—Joseph R. N. Owen, Hamilton, Nev.  
**SOLDIERING BOXES.**—Thomas J. Walsh, S. F.  
**PNEUMATIC DENTAL MALLETS.**—Samuel W. Dennis, S. F.  
**WINDMILLS.**—Nicholas Holden, San Jose, Cal.  
**SKWER TRAP AND FLUSHING GATE.**—John Peter Schmitz, S. F.

—The patents are not ready for delivery by the Patent Office until some 14 days after the date of issue.

**NOTE.**—Copies of U. S. and Foreign Patents furnished by DEWEY & CO. in the shortest time possible (by telegraph or otherwise) at the lowest rates. All patent business for Pacific coast inventors transacted with perfect security and in the shortest possible time.

### Signal Service Meteorological Report.

Week Ending September 25, 1877.

HIGHEST AND LOWEST BAROMETER.						
Sept. 10.	Sept. 20.	Sept. 21.	Sept. 22.	Sept. 23.	Sept. 24.	Sept. 25.
29.90	29.85	29.90	29.98	30.03	30.05	30.03
29.83	29.08	29.04	29.04	29.08	29.09	29.09
MINIMUM AND MAXIMUM THERMOMETER.						
62	62	63	64	68	60	70
52	55	54	52	53	53	54
MEAN DAILY HUMIDITY.						
84	83	72	65	75	74	74
PREVAILING WIND.						
SW	SW	W	W	W	NW	W
WIND—MILES TRAVELED.						
205	329	310	361	215	164	180
STATE OF WEATHER.						
Cloudy.	Cloudy.	Clear.	Clear.	Clear.	Clear.	Clear.
RAINFALL IN TWENTY-FOUR HOURS.						
Total rain during the season, from July 1, 1877.						0.02 in.

### METALS.

[WHOLESALE.]

THURSDAY, M., September 27, 1877.

IRON.			
American Pig, ton.....	28 00	@	32 00
Scott Pig, ton.....	32 00	@	33 00
White Pig, ton.....	28 00	@	—
Oregon Pig, ton.....	34 00	@	—
Reinforced Bar.....	5 00	@	61
Horse Shoes, keg.....	—	@	73
Nail Rod.....	—	@	73
Norway, Oval.....	—	@	73
Rolled.....	—	@	—
COPPER.			
Copper Tinned.....	37 00	@	40
Sheathing, lb.....	37 00	@	40
Sheathing, Yellow.....	21 00	@	22 1/2
Sheathing, Old Yellow.....	21 00	@	11
Composition Nails.....	24 00	@	—
Composition Bolts.....	24 00	@	—
STEEL.			
English Cast, lb.....	16 00	@	5
Drill.....	16 00	@	—
Flat Bar.....	15 00	@	18
Plow Steel.....	8 1/2	@	12 1/2
TIN PLATES.			
10x14x 1/2 Obarcoal.....	8 50	@	9 00
Banca Tin.....	24 00	@	—
Australian.....	19 00	@	20
ZINC.			
By the Case.....	11 00	@	—
Zinc Sheet 7x3 ft. 7 to 10, lb.....	11 00	@	—
7x3 ft. 11 to 14.....	11 00	@	—
8x4 ft. 8 to 10.....	12 00	@	—
8x4 ft. 11 to 19.....	12 00	@	—
NAILS.			
Assorted sizes.....	3 00	@	25
QUICKSILVER.....	47 1/2	@	50

### LEATHER.

[WHOLESALE.]

WEDNESDAY M., September 26, 1877.

Sole Leather, heavy, lb.....	26 00	@	29
Light.....	22 00	@	24
Jodok, 8 Kil, doz.....	43 00	@	50
14 to 18 Kil.....	30 00	@	30
14 to 18 Kil.....	30 00	@	30
Second Choice, 12 to 18 Kil.....	55 00	@	70
Cornellian, 12 to 18 Kil.....	57 00	@	67
Fendler, 12 to 18 Kil.....	57 00	@	67
14 to 15 Kil.....	71 00	@	75
Simon Ulmo, Females, 12 to 18 Kil.....	58 00	@	62
14 to 15 Kil.....	65 00	@	70
16 to 17 Kil.....	72 00	@	74
Simon, 18 Kil.....	51 00	@	63
20 Kil.....	55 00	@	67
24 Kil.....	72 00	@	74
Robert Calif, 7 and 9 Kil.....	35 00	@	40
Kils, French, lb.....	1 00	@	1 35
Cal. doz.....	40 00	@	60
French Sheep, all colors.....	3 00	@	15
Eastern Calif for Backs, lb.....	1 00	@	1 25
Sheep Roms for Topping, all colors, doz.....	9 00	@	13
For Linings.....	5 50	@	10 50
Cal. Russet Sheep Linings.....	1 75	@	4 50
Boot Lega, French Calif, pair.....	4 00	@	—
4 doz.....	1 00	@	75
Best Jodok Calif.....	5 00	@	5 25
Leather, Harness, lb.....	35 00	@	38
Fair Bridle, doz.....	48 00	@	72
Skirting, lb.....	1 00	@	27
Well, doz.....	30 00	@	50
Buff, ft.....	18 00	@	20
Wax Slide.....	1 00	@	18

### Gold, Legal Tenders, Exchange, Etc.

[Corrected Weekly by SUTRO & CO.]

SAN FRANCISCO, September 28, 3 P. M.

**LEGAL TENDERS** in \$ 8, 11 A. M., 971/2@97. **SILVER**, 441 Gold in New York 103 1/2.  
**OLD BARS**, 900, **SILVER BARS**, 9@15 1/2 cent. dis. cont.  
**EXCHANGE** on New York, 1 1/2; on London bankers, 49 1/2; Commercial, 49 1/2; Paris, first francs @ dollar; Mexican dollars, 53.  
**LONDON** Consols 95 5/8; Bonds, 107 1/2.  
**QUICKSILVER** in S. F., by the tank, 48 1/2@50.

### Mining and Other Companies.

Persons interested in incorporated shares will do well to recommend the publication of the official notices of their companies in this paper, as the cheapest appropriate medium for the same.

#### California Fruit Growing Association.

Location of principal place of business, San Francisco, Cal.  
Location of property, El Dorado Co.  
Notice is hereby given that at a meeting of the Board of Directors, held on the fourteenth day of August, 1877, an assessment (No. 8.) of 23 per share was levied upon the capital stock of the corporation, payable immediately in U. S. gold coin, to the Secretary, at the office of the company, 331 Sansome Street, San Francisco, Cal.  
Any stock upon which this assessment shall remain unpaid on the fourteenth day of September, 1877, will be delinquent, and advertised for sale at public auction, and unless payment is made before, will be sold on Monday, the first day of October, 1877, to pay the delinquent assessment, together with costs of advertising and expenses of sale. By order of the Board of Directors. HORACE JONES, Secy.  
Office, 331 Sansome St., San Francisco, Cal.

**POSTPONEMENT.**—The day for decimating the stock delinquent on the above assessment is hereby postponed until Saturday, September twenty-second, 1877, and the sale thereof until Monday, October eighth, 1877. By order of the Board of Trustees. HORACE JONES, Secy.

#### Dolores Consolidated Mining Company.

Location of principal place of business, San Francisco, Cal.  
Location of works, Wilson Mining District, Esmeralda County, Nevada.  
Notice.—There are delinquent on the following described stock, on account of assessment No. two (2), levied on the seventh of August, 1877, the several amounts set opposite the names of the respective shareholders, as follows:

Names.	No. Certificate.	No. Shares.	Am't.
Blasdel, H. G., trustee (left of certificate No. 16).....	155	5000	\$625 00
Blasdel, H. G., trustee (left of certificate No. 17).....	156	2500	312 50
Blasdel, H. G., trustee (left of certificate No. 18).....	157	2500	312 50
Blasdel, H. G., trustee (left of certificate No. 19).....	158	2500	312 50
Brannan, Joseph.....	54	25000	3125 50
Drexler, L. P. & Co., trustee (left of certificate No. 5).....	150	12500	1562 50
Fry, J. D., trustee.....	7	10000	1250 00
Keene, J. R., trustee.....	9	10000	1250 00
Richardson, E. A., trustee.....	48	6000	750 00
Richardson, E. A., trustee.....	49	100	12 50
Richardson, E. A., trustee.....	50	100	12 50
Richardson, E. A., trustee.....	51	40	5 00
Williams, John H., trustee.....	30	50	6 25
Wacker, Gustavus.....	47	18747	2343 37 1/2

And in accordance with law, and an order of the Board of Directors, made on the seventh (7th) day of August, 1877, so many shares of each parcel of such stock as may be necessary will be sold at public auction, at the office of the Secretary,



## Iron and Machine Works.

**PACIFIC ROLLING MILL CO.,**  
SAN FRANCISCO, CAL.

Established for the Manufacture of  
RAILROAD AND OTHER IRON

Every Variety of Shafting,  
Embracing ALL SIZES of  
Steamboat Shafts, Cranks, Piston and Con-  
necting Rods, Car and Locomotive  
Axles and Frames,

Hammered Iron of Every Description and Size  
Orders addressed to PACIFIC ROLLING MILL  
COMPANY, P. O. Box 2032, San Francisco, Cal., will re-  
ceive prompt attention. Office: 16 First Street.  
The highest price paid for Scrap Iron.

THOS. PENDERGAST.

HENRY S. SMITH

## ÆTNA IRON WORKS,

MANUFACTURERS OF

## IRON CASTINGS

and MACHINERY

OF ALL KINDS.

Fremont Street, Bet. Howard and Folsom

SAN FRANCISCO.

## SHEET IRON PIPE.

## Risdon Iron and Locomotive Works

Corner Howard and Beale Streets,

Are prepared to make SHEET IRON AND ASPHALTUM  
PIPE, of any size and for any pressure, and contract to  
lay the same where wanted, guaranteeing a perfect work-  
ing pipe with the least amount of material.  
Standard sizes of Railroad Car Wheels, with special pat-  
terns for Mining Cars. These small wheels are made of  
the best Car Wheel Iron, properly chilled, and can be  
fitted up with the improved axle and box—introduced by  
this company, and guaranteed to outlast any other wheels  
made in this State.

All kinds of Machinery made and repaired.

JOSEPH MOORE, Superintendent.

## PHELPS MANUFACTURING COMPANY.

Manufacturers of all kinds of

Wharf and Bridge Bolts, Railroad Trestle  
Work, Car Frames and Bolts, Machine  
Bolts, Set Screws and Tap Bolts,  
Lag or Coach Screws.

ALL STYLES OF FANCY HEAD BOLTS.  
HOT AND COLD PRESSED HEXAGONAL AND  
SQUARE NUTS, WASHERS, BOLT ENDS,  
TURNBUCKLES, ETC., ETC.

13, 15 & 17 Drumm St., near California,  
SAN FRANCISCO, CAL.

## SACRAMENTO BOILER WORKS,

37 Fremont St., cor. Mission, S. F.

## HALL & KELSHAW,

PRACTICAL BOILER MAKERS,

Marine, Stationary and Portable Boilers, Smoke Stacks,  
Hydraulic Pipe, Oil or Water Tanks, Ore and  
Water Buckets, Gasometers, Girders, Bridges  
and Iron Ship Building.

ALL KINDS OF SHEET IRON WORK.  
Repairing promptly attended to at the  
lowest possible terms.

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Manufacture Iron Castings and Machinery  
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STEVENSON'S PATENT

Mold-Board AMALGAMATORS,

Golden State Pressure Blowers.

First St., between Howard & Folsom, S. F.

## CALIFORNIA BRASS FOUNDRY,

No. 125 First Street, Opposite Minna,  
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All kinds of Brass, Composition, Zinc, and Babbitt  
Metal Castings, Brass Ship Work of all kinds, Spikes,  
Sheathing Nails, Rudder Braces, Hinges, Ship and Steam-  
boat Bells and Gongs of superior tone. All kinds of Cooks  
and Valves, Hydraulic Pipes and Nozzles, and Hose Coupl-  
ings and Connections of all sizes and patterns, furnished  
with dispatch. PRICES MODERATE.  
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And General Machinists

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For Mining and Other Purposes.

Steam Engines and all Kinds of Mill and Mining Machinery

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INCLUDING BATTERIES, AMALGAMATING PANS AND SETTLERS, CONCENTRATORS, ORE FEEDERS,  
CRUSHING ROLLS AND ROCK BREAKERS. ALSO, WATER JACKET SMELTING FURNACES,  
FOR REDUCING LEAD, SILVER AND COPPER ORES, QUICKSILVER FURNACES,  
RETORTS AND CONDENSERS, ROASTING AND CHLORIDIZING FURNACES,  
SUGAR MILL MACHINERY, WATER WHEELS, ETC., ALL OF THE  
LATEST AND MOST IMPROVED CONSTRUCTION.

Agents for the Allen Engine Governor, Cook's Boiler Feeder and Heater, Buckminster  
Rock Drills and Air Compressors, Wheeler's Ore Breaker, Etc.

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Light and Heavy Castings of Every De-  
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The Only Illuminating Tile Manufactured for Light-  
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BOILER MAKERS AND

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Guaranteed to Chloridize from 85 to 95 per cent. of any  
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shape for working in cupola furnaces.

Cost of Roasting and Chloridizing 20 Tons  
in 24 Hours by this Process:

One man.....	\$ 4 00
One man.....	3 00
Wood—2½ Cords at 83 per cord.....	5 25
Salt—1,600 lbs at 2½ cents.....	40 00

Cost of 20 tons.....\$52 25  
Cost of one ton.....2 61½  
In a furnace of three or four times this capacity the  
cost is decreased by 20 per cent.

The furnace is now working successfully at the Poe Con-  
solidated Co.'s mines, in Peavine District, Nev., and at  
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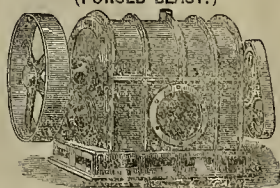
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This is a complete, perfect and economical adaptation  
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And other base metals, or to ores free from base metals.  
It can be adapted to any first-class Gold or Silver mill, at  
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A Mechanical Engineer, having an extensive experience  
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# \$1,000 Challenge Ore Feeder,

AWARDED FIRST PREMIUM

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It may be considered as now fully demonstrated, by careful and long-continued experimentation, that the plan upon which a perfect ore feeder must be constructed is that of the carrier, and not that of the shaking table. Uniform and accurate feeding is not possible upon the latter plan. The ore must be evenly carried, upon a steadily advancing plane or table, to the line of discharge, and there simply dropped. Spasmodic or jerky contrivances will not answer the purpose.

We warrant the machines to give perfect satisfaction, and to be a better and more durable Feeder than any other in the market, and will sell them as cheap as any other of its class.

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O. H. Bogart, 402 Montgomery St., San Francisco, Cal.  
Bardwell, Walter & Co., 408 California St., S. F., Cal.  
Haggin & Tevis, 50 Nevada Block, San Francisco, Cal.  
Eclipse Mill, Independence, Inyo County, Cal.  
Silver King Mining Company, Arizona.  
Gold Stripes Mining Company, Plumas County, Cal.  
Crescent Mine, Plumas County, Cal.  
Hidden Treasure, Deadwood, Black Hills.  
S. B. Schronitz, Del Norte, Colorado.  
Little Anna Mine, Colorado.  
Briggs Bro., Black Harker, Colorado.

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Julian Mill, Newcastle, Placer County, Cal.  
St. Patrick Mining Company, New Castle, Placer Co., Cal.  
Bunker Hill Mill, Amador County, Cal.  
Gover Mining Company, Amador County, Cal.  
Talisman Mining Company, Amador County, Cal.  
O. C. Hewitt, Keystone C. M. Co., Amador City, Cal.  
Boston Mill, Gold Hill, Nevada.  
Soulby Mill, Tuolumne County, Cal.  
California Company, Nevada County, Cal.  
Omaha Gold Mining Company, Grass Valley, Cal.  
Star Mine, Sonora, Tuolumne County, Cal.  
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S. D. B. Stewart, Lincoln G. M. Co., Sutter Creek, Cal.

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The Tulloch Ore-Feeder, after having been in use for about six months in the "Gold Stripes Mine," at Greenville, Plumas County, Cal., has also been superseded by the \$1,000 Challenge Ore Feeder.

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Backward in Coming Forward—Challenge is Still open. Gentlemen,  
Put up or Shut up.

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Some good mining claims near Sheridan, Montana Territory, can be purchased at present on very favorable terms. Positive information can be obtained by addressing

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All persons, excepting those having the right by purchase from me, are hereby cautioned against using, or making, or selling any device for turning the discharge pipes of hydraulic machines which uses the deflecting force of the stream of water.

Any such device is an infringement of United States Letters Patent, granted to me on the 16th of May, 1876, and re-issued September 19th, 1876.

I have commenced suit against Richard Hoskin for infringing my said patent, and intend to prosecute all parties using such Deflectors without license from me, there being no other way to protect my rights.

Any parties wishing to purchase the right to use this device can do so by making application to me.

HENRY C. PERKINS,

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65 LARGE MIXED CARDS, with name 10c.  
and 3 ct. stamp. 25 styles Fun Cards, 10c. Samples 6c. M. DOWD & CO., Bristol, Conn.

25 ELEGANT CARDS, no two alike, with name, 10 cents, post paid. J. B. HUSTED, Nassau, N. Y.

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Those who manufacture a superior article, or put up improved packages of merchandise, should protect themselves from imitations by registering their Trade Marks.

We have special facilities for securing full rights by the registration of Trade Marks, and our terms are very reasonable.

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For Steam Boilers, Pipes, etc. Best non-conductor of heat in use. It effects a LARGE SAVING OF FUEL, LASTS AS LONG AS THE IRON to which it is applied, and is reasonable in cost.

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United States and Foreign

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ASBESTOS STEAM PACKING, made from pure long fiber Asbestos. Indestructible and Self-Lubricating. Circulars and Descriptive Pamphlets Sent Free.

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Manufactured by M. C. BULLOCK.

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We have the best Imitation Gold Watch in the Market for Trading Purposes. The metal is a composition of other metals, as closely resembling pure gold that the best judges find it difficult to detect the difference, except by a chemical test, and it has the virtues requisite to make it the best substitute for gold known. GENUINE AMERICAN MOVEMENT. EXPANSION BALANCE. BEAUTIFULLY ENGRAVED OR ENGINE TURNED HUNTING CASES, and equal in appearance to a GOLD WATCH THAT COSTS FROM \$150 TO \$200. It sells and trades readily, for from \$20 to \$30, and if you wish a watch for your own use or to make money, we try this. Owing to our large sales, we are enabled to reduce the price of them to \$12 each with an elegant Chain attached. They are used on Railroad, Steamers, and in Minniefactories, and other places where accurate time is required, and gives general satisfaction. We send them by Mail or Express on receipt of \$12, to any part of the Country, or it will be sent C.O.D. when the customer desires and remits \$3 on account. These Elegant CHAINS weigh about fifty Pennyweights, and the same pattern in pure gold would cost \$100. We sell these Chains at \$3 each. But we sell the Watch and Chain for \$12, sent by Mail in a Registered Package, post-paid, to any Post Office in the United States.

WE SELL THE WATCH WITHOUT THE CHAIN FOR \$10.  
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cient variation of power cannot be secured by wyeing or tacking the line, then a change of drum will secure it; in fact,  
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hoisting purposes, are so evident, that we may predict that they are destined to become an indispensable tool in all such  
pursuits. It is an Iron Machine, and consists of a double-faced spur wheel, fitted to revolve around a stationary iron frame  
or circle, with a shaft passing diagonally through both frame and wheel, and secured to the frame by boxes, thus forming  
journals, and geared to the drive wheel by pinions at each end and on opposite faces of the wheel, thus communicating the  
power to both ends of the shaft at the same time. On this shaft the drum for winding the rope on is suspended, with a  
clutch for attaching or discharging it, and a friction strap around the drum for regulating and retarding the uncoil of the  
line, or lowering of the weight. The iron frame is bolted firmly to the wood frame or bed, and a seat secured to it, the  
whole being immovable, and the horse revolves the drive wheel around it, thus revolving the pinions and communicating  
motion to the drum shaft. A mitchet attached to the frame secures the drive wheel from running back when the horse  
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# MINING AND SCIENTIFIC PRESS.

An Illustrated Journal of Mining, Popular Science and General News.

BY DEWEY & CO.,  
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## The Loss by the Patent Office Fire.

The losses to the country by the Patent Office fire were very great. In the north hall the models to the following inventions were entirely destroyed: Wood-working (four classes), wood screws, wire-working, water wheels, water distribution, tubing and wire, stabling, sheet metal, seeders and planters, saws, railways (four classes), pumps, pneumatics, plows, ores, needles and pins, nails, mills, metal-working (seven classes), metallurgy, horse shoes, harvesters, harrows, hardware manufacture, grinding and polishing, garden and orchard, files, dairy, casting, brakes and gius, nuts and rivets, bolts, bee-hives, baths and closets, aeration and bottling. Aggregate number of models destroyed in this hall, 57,000; valued at \$885,000.

In the west hall the following were burned: Models of bridges, brushes and brooms, tobacco, threshing, lime and cement, stone roofing, presses, paving, mechanical powers, car couplings, masonry, churns, journals and bearings, engineering, hydraulics, hoisting, glass, fences, excavators, carriages, and wagons, carpentry, butchering. Aggregating 36,500 models at a total value of \$511,000.

In the east and south halls, besides the famous relics of the father of our country and other patriots, models of the following inventions escaped destruction: Sewing machines, fire arms, looms, carding machines, trunks, taoning, surgery, sugar, stills, signals, preserving food, plating, paint, optics, fats and glue, oils, measuring instruments, manures, leather, ice, hose and belting, horology, harness, gunpowder, gas, fuel, electricity, drafting, dental, cutlery, coffins, clay, clasps and buckles, chemical miscellaneous, caoutchouc, boots and shoes, bleaching and dyeing, beer and wine, artificial limbs, felting and hats, fine arts, fishing, furniture, games and toys, governors, jewelry, kitchen utensils, knitting and netting, lamps and gas fitting, laundry, locks and latches, music, ordnance, paper making, paper manufactures, photography, printing, projectiles, safes, ships (two classes), silk, spinning, stationery, steam, stoves and furnaces, toilet, umbrellas and fans, valves, weaving, educational, dryers and kilns, crimoline and corsets, cordage, cloth, builders' hardware, book binding, boats, beds and apparel.

## The Dexter Scroll Saw.

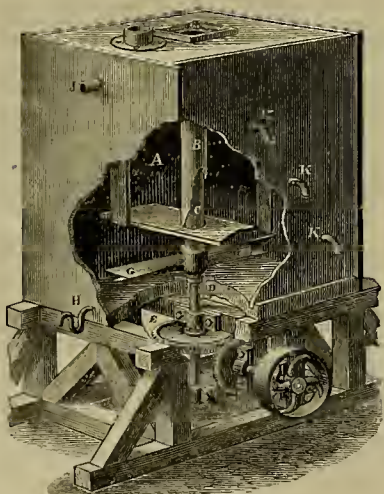
Since the advent of the Fleetwood scroll saws, some four years ago, and which were the first really practical machines of the kind for fine work, many different styles have been introduced. A new machine, made by the same manufacturers, is shown on this page. It has just come out, is simple and graceful, thoroughly made of the best materials, durable, light running and accurate in execution, besides being sold at a remarkably low price. Any further description of the machine is unnecessary, as the cut plainly shows its construction. Information as to price, etc., can be obtained of the inventors and manufacturers, Trump Bros., Wilmington, Del., or C. F. Marwedel, 56 First street, San Francisco, who has all the machines of their manufacture for sale.

**THE EMMA MINE.**—The Salt Lake Herald says: It appears by the Emma lease, the mine is not to be so extensively worked as was at first thought. The lessee, we understand, is to make no developments, merely confining his operations to the old workings. However, there is known to be considerable ore that can be taken out without breaking new ground. The lease, nominally for two years, permits the owner, Trenor W. Park, to resume possession of the property at any time upon payment to the lessee of a certain sum. It is probable that within a few months, at the outside, Mr. Park will put a force of men at work and find out for a certainty what there is in the Emma.

The coinage at the Mints of the United States in the month of September was: Double eagles, \$4,492,200; trade dollars, \$1,677,000; half dollars, \$408,400; quarter dollars, \$349,600; dimes, \$129,000. Total, \$7,056,200.

## An Improved Quicksilver Condenser.

In the condensation of mercurial vapors it has long been customary to perform this work in dry chambers which are kept cool in various ways, and in some instances a spray of water has been showered down through a tower to meet the upwardly-moving vapor, so as to condense it. It has hitherto been found difficult to introduce mercurial vapors beneath water so as to condense them by actual contact, on account of the difficulty in properly discharging such vapors at the bottom of a tank, and because if the pressure necessary to overcome the weight of the water and the consequent back pressure and attendant leakage of fumes between the furnace and condenser. It has been customary to conduct the mercurial vapors through a number of brick, iron or wooden chambers, kept cool in various ways, but the difficulty has been to prevent waste by fumes escaping uncondensed. The condenser illustrated herewith is designed to overcome these difficulties, and was patented through the MIN- AND SCIENTIFIC Patent Agency by Wm. H. Long and Alexander W. Castle. The invention consists of a vessel wherein the vapors are conveyed beneath the surface of the water contained therein by the centrifugal force caused



Castle & Long's Quicksilver Condenser.

by the motion of hollow, open-ended arms, which unite with the central hollow conveying tube, and are caused to rotate with it by suitable mechanism. A supply of cold water is kept up, a suitable trap is provided for withdrawing the metallic mercury without the water, and stops are placed within the condenser to prevent the rotation of the water by the action of the arms.

In the engraving, *A* is a square chamber, of which as many may be placed in succession as may be desired. This chamber has a pipe, *B*, which enters at the top, and extends down toward the bottom in an axial line of the chamber. This pipe is stationary, and another pipe, *C*, extends upward into the pipe, *B*, so as to turn easily, but make a close joint. The journal of the pipe, *C*, extends through a stuffing-box, *D*, at the bottom of the vessel or chamber, and by means of a bevel-gear, *E*, and shaft, motion is communicated to the pipe, *C*. Near the bottom of the chamber this pipe is provided with hollow arms, *G*, *G*.

In the engraving two arms are shown projecting from the pipe, *C*, but as many may be used as may be useful. The arms may be of any desirable shape, but are shown here as triangular in section, this form giving less resistance as the arms pass through the water. At their extremities these arms are bent, or made, as in the present case, with an opening at the back of the outer end.

The operation will then be as follows: The furnace being in operation the fumes will arrive

at the chamber through the pipe, *B*. The pipe, *C*, is caused to rotate with sufficient rapidity to produce a vacuum in the arms, *G*, resulting from their passage through the body of water, said arms also acting as agitators during their passage through the water. This causes the fumes to rush down the pipe, *C*, out through the arms, *G*, and thence into the water, being thoroughly distributed by the movement, and discharged without any objectionable back pressure upon the furnace or retort. The mercury will thus be condensed, and will fill the rim around the edge of the bottom, which is made convex in the center for that purpose. When a sufficient amount has collected the mercury will commence to flow out through the pipe, *H*, which is bent upon itself, as shown, so as to form a trap and prevent any water from escaping.

The chamber being square rectifies any tendency of revolution of the water. The water is kept cool by allowing the current to enter at the pipe, *J*, and escape at either of the openings, *K*, as may be desired. The top of the chamber is perforated for the escape of any uncondensed fumes or gases which may be led by pipe into another like chamber. As each chamber is provided with its own exhausting or vacuum-producing mechanism, it will be manifest that as many as may be desired can be used without producing any back pressure or influence upon any of the others.

It will be noticed that the arms act as agita-



The Mounted Dexter Scroll Saw.

tators, thoroughly distributing the vapor through the water, and dispensing with an additional agitating device, which has been found necessary where, in the place of the arms a centrifugal wheel was used, consisting of a hollow circular disk.

The inventors claim that their improved condenser will save every particle of quicksilver for a quarter of the cost of the various kinds in use. The condenser will also be found useful in all chemical works, lead works, etc., where poisonous gases are apt to escape in the fumes. It can be attached to a stack, and draws off the fumes wherever necessary, forcing the fumes under water of any required depth, so as to condense them. Those desiring further particulars may address Wm. H. Long, San Jose, or A. W. Castle, Guadalupe quicksilver mines, Santa Clara county.

**ACADEMY OF SCIENCES.**—The California Academy of Sciences met on Monday night, Vice-President Hyde in the chair. There were no donations to the cabinet. Dr. Kellogg read a description of three new plants—*Malastrum maritimum*, collected by the late Dr. Veatch in Lower California; and *Collomia gilioides*, found by Henry Edwards on the Sierra Nevada mountains, and a variety of *Penstemon*, or beard-tongue, found by him at Fremont's Peak, 8,000 feet above the sea.

It is estimated that 750,000 persons have died from famine in India.

## The New Stock Exchange.

The new building of the San Francisco Stock and Exchange Board was formally opened on Monday. The building is one of the finest in the city. The corner-stone of the new structure was laid April 27th, 1876, and since then work upon it has been pushed vigorously. It is five stories in height, with a tower surmounting the center. It is built throughout of granite in different colors and forms of polish, and all the materials in its construction are of the costliest character. The exterior of the building is very handsome, the facade being especially rich with its alternate layers of light and dark colored granite, its broad entrance, crowned by a group of statuary, its massive pillars of polished granite and its innumerable plate-glass windows. The dimensions of the building are 77 feet 9 inches on Pine street, by 137 feet 6 inches in depth, and the main building is 82 feet high, the tower rising 65 feet above the roof. The general plan of the building has been to provide magnificent offices for brokers, and at the same time to provide a splendid room for the Board sessions. The main entrance, therefore, is flanked on either side by spacious offices, the chief feature of which are the immense windows, framing single sheets of glass 15 feet 6 inches by 10 feet. The main entrance has a flooring of the finest English tiles, the walls are wainscotted with black and gray marble, and fronting the visitor are the great doors opening into the vestibule. These doors are very elegant, being made of oak-wood and elaborately carved. On the right of the entrance is a row of letter-boxes for the different offices in the building, each box being fitted with an electric bell and a speaking-tube. Passing through the carved doors above mentioned, one enters the vestibule, on either side of which is a good-sized committee room. Another pair of handsome doors being passed, the visitor finds himself in the Board room. It is about 77 feet square, and 47 feet to the ceiling, which is semi-domed, and so perforated as to make the ventilation perfect. The room is an irregular octagon, in the center of which is a large oval space for the use of members in their dealings. Around this oval are ranged two rows of chairs, 80 in number, handsome in design and commodious in shape. Back of them runs a black walnut railing, behind which are placed 132 seats for privileged spectators, while standing room is left for nearly twice as many more. The room is wainscotted with Belgian black marble, 14 inches wide, above which, to a height of five feet six inches, runs a broad paneling of grayish marble from Knoxville, Tennessee. Above this again extends a paneling of beautifully carved primavera wood.

At the southern end of the room stands the caller's rostrum, built of black walnut, behind which is a frescoed alcove, and above an arch of carved wood, supporting on either side a bear chiseled from the same wood, and in the center the coat of arms of California cut in the same material. Back of the rostrum are two large fire-proof safes, set into the wall, in which are kept the books and papers of the Board. A wide gallery extends around all but the southern portion of the room, of which a portion is set apart for the use of the ladies, and around it runs a rich bronze railing, which is relieved by alternate heads of bears and hulls. A peculiar feature of the room is that the gavel is dispensed with, a large gong being used in its stead, and is rung by telegraph. The Board room is lighted by a large skylight above, and by a large and four smaller windows on the eastern and western sides.

The ground upon which the new building stands cost \$193,000, and \$450,000 have already been expended upon the building itself, making the total outlay something over \$640,000.

RECENT dispatches from Peru says Henry Meiggs has become financially embarrassed and unable to redeem the hills issued by the Public Works Company, of which he is President, and that in consequence of these difficulties work on some of the railroads in that country is likely to be temporarily, if not permanently suspended.



## CORRESPONDENCE.

It is the desire of the editors of this journal to be liberal toward all correspondents, and therefore statements and opinions are frequently published, on the authority of the writers, for which we do not assume responsibility.

### Two Days in the High Sierra with Hooker and Gray.

[Written for the Press by J. G. LEMMON.]

"We have accepted an invitation from Gen. Bidwell to be taken to ascend Shasta. Sir Joseph's time is so limited that we cannot make you that long-promised visit at Webber lake, but we must have at least a day with you. Come over to Truckee and go with us to Tahoe," wrote Dr. Gray, from the Palace hotel, San Francisco.

My warning was short and preparations consequently brief. Almost at the last moment my aged mother bethought herself of this chance to visit some dear friends on the farther side of Tahoe; so, conveniences for her comfort were added to those already composing the equipment of the little botanical wagon, and soon we were gliding up and over the cool mountains beneath the grand old pitch and sugar pines and the white and red firs—not only the great wealth of the Pacific States, surpassing their precious metals, but the wonder, delight and envy of foreigners.

By 6 P. M. we had crossed, in succession, the Little Truckee, Sardine, Russell, and Prosser Creek valleys, with their intervening ridges, and had entered upon a cold elevated plateau, denuded of trees, telling that the noted lumber-producing region of Truckee was near.

At midnight of September 11th, 1877, the long, overland train emerged from the lofty summit tunnels of the C. P. R. R., and thundered down by the Truckee hotel. By the use of the telegraph we had learned that the great scientists, joined by Dr. Harkness at Sacramento, were surely on this train.

"Is that you, Lemmon?" shouted Dr. H., from the platform.

"Yes," I replied; "and, judging from the gray beard, this must be Dr. Gray, the father of American botanists," I added, approaching a small, quick-motioned, keen-looking man hastening towards us.

"Yes, yes," said a quick voice, accompanying a swift grasp of the hand, "the grandfather of them."

And thus commenced one of the most informal and oddest of greetings. The tall form of Sir Joseph soon appeared descending the steps, and, as became his noble bearing, Dr. H. announced him to the company with due ceremony.

Dr. H. had already planned the next day's excursion.

A special train drew out of the depot at the early hour of 6½ A. M., bearing Sir Joseph Hooker, Sir David Wedderburn (also an eminent English traveler and scientist), Dr. Asa Gray, Dr. W. H. Harkness and the writer (leaving Mrs. Gray at the hotel to rest), all bound for the summit station, where we found that six inches of snow had fallen the previous night. The sun was swiftly clearing it off the corrugated face of Mt. Stanford (until lately called Castle peak) our objective point, six miles to the north; and while he continued his welcome labor we partook of breakfast with a gusto, born of the long delay and the keen atmosphere.

#### Climbing Mount Stanford.

Preparing for the ascent, the Englishmen seemed only to take a deep inspiration; Dr. Gray hardly stopped for that; Dr. Harkness laid aside a wrapper, while the writer took off his overcoat and seized a stout, long stick for an alpenstock. Mr. Hill, the host at the Summit house, kindly acted as guide for the first and most obscure part of the way. The writer was held responsible as supplementary guide, and was at once installed as prompter to the botanists, since the flora was familiar to him.

"Is this *Wyethia angustifolia*?" called Dr. Gray, snatching up the first plant met with.

"No, it is *Helianthella Californica*," I gleefully replied, making the most of this, my first triumph, won, of course, by the paucity of the specimen and the brevity of Dr. Gray's glance.

The keen eyes of the little chief soon became accustomed to the new scenes, and not a plant, however small, or withered, or secreted by rock-cleft or chapparal, escaped his scrutiny. Sir Joseph Hooker began at once the examination of the trees. He is especially interested in noting correspondence between trees of different regions, and often pointed out resemblances to trees of New England, and of European forests. There are several knotty questions about our conifers which these masters in botanical science mean to settle, upon their return home and the comparison of their notes, taken industriously at every point where they have visited our forests during their extended tour.

This is the last stop they make; going from here to Davenport, Iowa, to confer with Dr. Perry, then to St. Louis to see Dr. Engelmann, with whom they expect a sharp engagement, the latter being a very keen observer, an extensive traveler, and making the forest trees of the United States his especial hobby.

#### Questions About Our Trees.

One of the questions is in regard to whether

our common white fir is identical with that first named by Douglas *Abies grandis*, and found on the cascades of the Columbia. Our California species Engelmann calls *A. concolor*. Our other balsam, the most beautiful and majestic tree in the State, is in jeopardy also. It is the rare and symmetrical-limbed, red-barked or silver fir, of high plateau, heretofore called by Douglas' name, *Picea amabilis*, but declared by Engelmann to be distinct, and named by him *Abies magnifica*. The reader will notice that the generic name is changed by Dr. E. also. There is a long tale to this subject. The two woods, *Abies* and *Picea*, are much controverted, and often applied by the leading authorities to the firs and spruces interchangeably. Of late years *Picea* has been dropped entirely, and the entire section of spruces with depending, persistent-scaled cones was united with the firs having upright, separating cones, and called *Abies*. But Dr. E., with great courage, and, as it seems to the writer, wisdom also, divides the family again, and restores the old name of *Picea*, but applies it to the spruces, leaving *Abies* for the firs, in accordance with Pliny and the older botanists.

The several forms of the cones are of particular interest, and, it seems, specimens are meager in Eastern collections. In the recent ascent of Shasta by these great botanists, they met with John Muir and Mr. Sisson, both keen observers, who declared that the cones of *Abies concolor* (Engel.) often show exserted bracts between the scales, a form never seen by the writer, who is familiar with the Sierras from Yosemite to Lassen. Should any reader meet with cones of the white fir, bearing upright apple-green cones about the size of turkey eggs, and having exserted three-parted bracts, they will confer a great favor by sending a cone, or all its scales, seeds, bracts, etc., loosely inclosed in a paper sack, to Dr. George Engelmann, 3003 Locust street, St. Louis.

The diverse forms of *Pinus ponderosa*, our common lumber pine, engaged particular attention. It has large and small cones, bright green and also blue-glaucous colored leaves; also great diversities of bark, wood, arrangement of leaves, etc. I once found a tree in Butterfly valley with all its leaves in fascicles of fives instead of threes, the normal number. Lumbermen recognize at least five kinds of this tree, and give it as many names. Our black spruce, *Picea Douglasii*, having exserted bract cones here about the size of a hen's egg, has them in the San Bernardino mountains four to nine inches long, almost establishing a distinct species there.

The junipers, too, are in limbo, and a gnarly old tree half way up Mt. Stanford yielded a host of specimens of wood, bark, eccentric growths, excrescences, sand-worm ridges, etc., which, with the assistance of a big knife, Sir Joseph transferred to his capacious pockets. The oaks of California were in a bad mood, until Dr. Engelmann lately cleared them up.

Dr. Harkness, with microscopic eyes, called frequent attention to various fungi on the herbage, and discoursed enthusiastically and learnedly upon them during breathing spells. The Doctor cannot fail of being of great use eventually, in his detection and study of the blights, blasts, molds, etc., which infest our vegetables. It is a very obscure subject, requiring the deepest study, the choicest instruments, and, withal, the utmost abstraction and patience. As Sir Joseph remarked to me, "Who, but Dr. Harkness, in all your State, would do it?"

Near the base of the final, nearly treeless turret-crowned shaft, Dr. H. and myself halted, kindled a pitch tree, took off our boots to wring out our stockings, and laid down on the rocks to rest and discuss the merits of our distinguished guests. The guide, Mr. Hill, had returned long before; Sir David had long since disappeared, too, but in the opposite direction, up the bald cliffs. Sir Joseph and Dr. Gray, leaving their collections with us, hastened on up the steep, pausing often, we could see, to examine a plant together, or to crowd bits of herbage into their long portfolios, their constant companions. Splendid, tireless, compact-brained men! Description is impossible. An attempt would be but a caricature.

On their return, two hours after, with Sir David, they reported great satisfaction with the flora—though past its season—and with the extended view from the top.

I had requested them particularly to note the appearance of the valley of Webber lake, and both declared that the view but increased their regret that time did not admit of their visit there, as all along promised and expected. An extra side excursion to Shasta took its place, and now they must hasten home. Dr. Gray also regretted not finding *Ranunculus corymbosus* and *Astragalus Austine*, both perished out of sight; but he obtained a desirable form of *Lauscheria Cal.*, now lost from the gardens East, and also several rare plants, including, perhaps, a new *Erigeron*.

Winding down amidst the rocks and groves, and over intervening ridges, Sir David became separated from the party; but as such casualties were expected, no concern was felt for him, and when we slid down to Truckee at night on the train, we were not surprised to find that the lost tourist had beaten us home by an hour, and that the grand ascent of the historic Mt. Stanford by the Hooker-Gray party was an old story.

#### Trip to Tahoe.

The second day's programme involved simply a pleasure trip to Tahoe, whirling along up the Truckee, its outlet, in a fast stage to its beach, then gliding silently over its blue waters—hence affording but little to tempt a mere botanist's

pen. Botanists endure stage-coaches because they can often get Jehu to put on the brake—as, erst, ours did with great promptness, when requested; but rail-cars are an abomination, and steamboats an unmixed evil. Nevertheless, on the cool deck of Captain Avery's steamer, when out in the deep, mysteriously blue sea, after the great savans had distinguished their last flower, the butter-weed of the shoaly water, and their last tree of the fading forest; after they had critically and briefly noted all the phases of scenery and drawn comparisons with that of Scotland and Switzerland, they sat down on the forward deck and entered into a familiar, easy chat, too personal to relate, but too charming and instructive ever to forget.

Arrived at Glenbrook, the botanists hastened away for an hour's run over the near hills, gathering cones, twigs, flowers, lichens, etc., enough to employ all our hands, including those of Mrs. Dr. Gray, who is no whit behind the Doctor in the use of the proper botanical words, and often accompanies him on short, easy excursions like this. When asked if she was not tired of our everlasting evergreen mountains, "Oh, no!" she exclaimed, "your *Pinus ponderosa* is so splendid and your *Abies amabilis* is just magnificent, as Dr. Engelmann describes it by his name."

The varieties of *Pinus ponderosa* found near Glenbrook were even more numerous and more distinctly defined than elsewhere met with: Dr. Gray visited a lumber factory and secured specimens of bark characteristic of this valuable tree. Trees were climbed for particular cones and limbs. Mrs. Dr. Gray's practical eye was put in frequent requisition to detect colors or decide between the disputing doctors—"green, blue, glaucous, shining," from her, ended all debate.

Sir David, glad to escape the narrow deck of the steamer, pushed over the hills, here and there, ending his brief exercise by scaling the Shakespeare rock, from which he reported a fine view of the lake. He left the party bere for the East via Carson and Virginia.

On our return to the hotel we found awaiting and visiting with my mother, the Hon. James A. Rigby and family, very cordial and intelligent persons, who, upon presentation to the great scientists, at once found themselves engaged, as by the eye of the ancient mariner; the rapid inquiries of the botanists being as speedily answered by Mr. Rigby, fully prepared for the ordeal by his large experience in lumbering. He bitterly regretted that he did not know of the contemplated visit of the Hooker-Gray party, so that he might have placed his own fine fast steamer at our service and accompanied us to points of interest—Emerald bay, Cornelian bay, Hot Springs, or Lehigh cove. As it was, he could only accompany us down to the steamer, call the Captain aside and order him to charge the expenses of the trip to him—the good, generous soul!

The return stage was halted but seldom, for time was short. A brief look was given to the pools of trout at the Corner fishery, a few rare plants were snatched from the hills and stuffed into portfolios. A new locality for *Rhamnus alnifolia*, abundant along the Truckee, was noted, and, just at sundown, the stage bore its dust-covered but pleasure-filled passengers to their hotel and supper.

Next ensued a most important and particular labor. A large, strong box was brought, placed in the hall before the doors of Hooker and Gray's rooms and opened. For an hour all hands were busied writing tickets, wrapping the fruits of late excursions in papers and packing properly in the box. All just finished in time for the eight o'clock express.

A breathing spell followed, coats were resumed and the usual quiet of rooms restored. Then followed a grand resume of the whole trip to California—expressions of entire satisfaction with its scenes and its people, especial mention being made in this connection of this, their last two days' experience; ending, as the night waned, with a few last commissions, a final injunction, a hearty grasp of the hand, a kind good-bye; and the midnight overland train, thundering along in the darkness, bore away, as it had brought, the great, matchless scientists, communicative gentlemen and indefatigable workers—Hooker and Gray.

Sierra Valley, Cal., Sept. 18th, 1877.

#### Investments in Sierra County.

Capitalists are waking up to the advantages possessed by this county as a field for prospecting. Quite a number of San Francisco mining men are seeking a chance to invest their surplus cash and help to develop the hidden riches hereabouts. Several Virginia City men have also acquired interests in this neighborhood, and the prospects were never better. Almost every day we see or hear of some one who left here for Washoe, when that excitement was at its height, having returned to prospect some spot that he thought well of in days gone by. The operations of the Pliocene company have probably done more to attract attention in San Francisco than any other one company. We are glad these men have discovered us. Our hills are full of gravel and quartz, and we only want the "open sesame" of all powerful capital to make this the richest county in California. A large number of favorable gravel locations can now be purchased or homed at moderate figures, and this section literally bristles with quartz ledges known to contain gold. When the Pliocene get down their shaft, locations on that ledge will be at a premium.

#### Eastern Nevada Mining Camps.

R. Hobart, of Virginia City, who has lately returned from a four weeks' trip among the mining towns and camps of eastern Nevada, gives the *Enterprise* the following account of some of the places he has visited:

##### Iron Monster.

At the Iron Monster mine, six miles northwest of West Gate station, be found Frank Maine and party bard at work sinking a shaft in the vein, which is 57 feet in width. They are now down something over 30 feet. They have already obtained ore that is rich enough to smelt, as it assays as high as from \$135 to \$140 per ton. The mountain in which the Iron Monster is situated is capped over with limestone. In this, wherever any little cropping out of quartz is discovered, by sinking a small shaft rich ore, similar to that in the main lead, is found. Ore has been found in this way in so many places on the east side of the mountain that some are of the opinion that all under the limestone is a solid mass of ore. This mountain is situated east of the old Silver Hill mining district and across a desert some miles in width. The owners of the Iron Monster vein intend putting up a furnace as soon as they are sure that they have enough rich ore to justify the outlay.

##### Lodi.

Is 35 miles south of West Gate, and the principal mine of the place is the Illinois, of which Uncle Billy Raymond, the locator of the Raymond & Ely mine, Eureka, is the principal owner. The ledge is only four or five feet in width, but is very rich. It is worked by smelting and pays from \$400 to \$700 per ton. It is in a limestone formation, with porphyry on one side. Mr. Raymond is now in California making arrangements for the erection of a furnace. There are about 200 men in the camp, which is quite a lively one.

##### Carbonate Point.

The Downey boys have a rich claim at Carbonate Point, five or six miles from Lodi. The point of the mountain where their mine is situated is capped over with limestone, and all below seems to be a mass of ore, as it is reached wherever they cut through the cap rock. The Downeys have shipped several tons of their ore to California, which paid them from \$400 to \$500 per ton.

##### Old Mammoth.

The old Mammoth district is at present pretty much deserted, though the owners of some of the mines are talking about resuming operations. The old mill of the district is running on tailings which are paying well. Mammoth district is about 10 miles southeast of Lodi.

##### Ione City.

Is quite a lively camp. The Storm King, owned by the Ural mill and mining company, is the leading mine of the place. They have been trying the leaching process in working their ores. The experiment cost them \$50,000, when they found it would not answer. They are now preparing to work their ores free. They are down on an incline some 400 or 500 feet, but not more than 200 feet perpendicularly. Their ores run about 12% in gold, and are rich in silver, paying about \$100 per ton. There are about 300 persons in the camp. Good prospects are being obtained in quite a number of mines in the place.

##### Tybo.

Is about 12 miles north of Hot creek, and the Two G is the principal mine. The vein is from four to seven feet in width. The owners of the mine are running two furnaces, in which they smelt 80 tons of ore every 24 hours. They are down about 400 feet and have proper hoisting works; also a sawmill for sawing lumber for use in their shaft. It is a lively little camp of 250 or 300 persons, all of whom are at work.

##### A Group of Camps.

At Belmont all the mills are at present idle. At Danville, 55 miles north of Belmont, a few men are at work on promising leads. The ores are such as must be roasted before milled or smelted. No one in the district has capital with which to properly open and work the mines.

All is rather quiet at Hot creek at present. At Rattlesnake canyon is a mine owned by Franklin & Donahue which assays as high as \$135 per ton, but the owners lack capital with which to work the mine.

At Jefferson canyon is a mine and mill with a roasting furnace. The mine yielded about \$1,500,000 when a fault was reached and work was suspended. It is supposed that the lead might be easily recovered should the mine be taken hold of by experienced miners.

AN IDEA IN REFRIGERATION.—Housekeepers who are troubled with moisture in their refrigerators will be glad to learn how it may be prevented. Fresh, unslacked lime, in small quantities, say a quart, placed in a refrigerator, will gradually absorb all the moisture in the provision chamber. The consequence will be a dry cold atmosphere, in which meat and other articles sensitive to the presence of moisture can be kept sweet for a long time. A little experience will soon enable one to know when to renew the lime and how much to use at a time.



## MECHANICAL PROGRESS.

### Making Picture Frame Ornaments.

The following instructions are given for molding the ornamental parts of picture frames, upon which the gilding is to be laid: Boil seven pounds of the best glue in seven half-pints of water; melt three pounds of white resin in three pints of linseed (raw) oil. When the ingredients are well boiled, put them into a large vessel, and simmer them for half an hour, stirring it, and taking care it does not boil over. When this is done, pour the mixture into a large quantity of whitening (previously sifted and rolled fine), and mix it to the consistency of dough, and it is ready for molding into the required shapes. The above compo will keep for a long time in a damp place, or in a barrel of whitening. Compo, when cold, is very hard, and is heated by means of steam, when it assumes the consistency of dough. The ornaments are made by pressing the compo into molds made of boxwood, the ornament being countersunk into the wood. The ornaments are got out as follows: Take the mold, and well brush into it oil and turpentine to prevent the composition adhering to it. Roll sufficient warm compo in the hands into a convenient form to go into the mold, press carefully into every part with the fingers, then take a piece of board with a flat surface, wet it, and place on the back of the mold, put under an iron screw press, and the pressure, which is but for a few moments (a vice would answer the purpose), drives the compo into all the deep parts of the mold; take out of the press, and remove mold. After the compo has hardened a little, the ornament is cut off, and the remaining compo sliced off, to be again heated and used. The ornament, when first cut off, is very soft and pliable, and can be fitted to frames having heads, hollows, etc., without fear of breaking. When dry they should be backed up—that is, the spaces between the corner and frame filled up with compo softened in hot water, which will make the ornament thicker and stronger than before.

**ENGLISH BUSINESS REVIVING.**—Thus the *Colliery Guardian* jubilates: "Orders in the past fortnight have come in thick and threefold," was the cheery remark only a day or two ago of the principal of a great iron-consuming concern in the Midlands. "We have received more orders in the past ten days," was the remark made at about the same time by one of the largest hardware exporting merchants in this kingdom, "than we have received all the three months." More, it would be correct to write that there are hardware merchants in England who to-day are doing more business than at almost any similar time since the depression in trade began to appear some four years back. This is cheering. Too much for it is not claimed; but it is not disregarded in our survey of the "position," which, in a trade sense, is perceptibly improved. The whole home trade is better, and our export business is steadily expanding.

**HEATING TOWNS BY STEAM.**—According to the *Age of Steel*, the initial attempt at warming a village by steam at Lockport, N. Y., is a success. The cost is thought to be but little more than half the cost of stoves, although the great heat for kitchen apparatus may be less easy to furnish. From the steam boilers the supply of heat is forced through pipes laid under the ground to the buildings which are to be warmed. The main pipe, constructed of iron, is in size about five inches in diameter. Around the pipe is wound hair-cloth one-half to three-quarters of an inch in thickness, and over this is wrapped heavy Manila paper. Thus prepared the pipes are laid in hollow logs, which are covered with zinc.

**NOTE ON HOT JOURNALS.**—Chas. Beurgan writes to the *Railroad Gazette* concerning hot boxes. His suggestion is that when a journal gets hot it is cooled with water, and as the water cannot be applied to the top the lower part is cooled much more rapidly, thus to a certain extent hardening that side. In subsequent wear the journal becomes more or less oval, and as a consequence "runs hot" until taken out. I have been assured that in one case when the calipers were applied there was as much as one-sixteenth inch difference in diameters of some journals, and after being turned down they ran 800-mile trips as cool as any journals ever did.

**FAST RUN.**—Probably the fastest run for any considerable distance ever made on a railway in America, says the *Railway Age*, was that achieved on the Canada Southern road one day last week, when the distance between St. Thomas and Amherstburg, Can., 111 miles, was covered in 109 minutes. It is said that one mile was made in 54 seconds, which would be at the rate of 70 miles an hour—a speed that has been attained in England, though probably not for years.

**INDUSTRIAL ARTS EXHIBITION AT LEIPZIG.**—Efforts are being made to open in Leipzig, in the course of 1878, an exhibition of the latest products of the industrial skill of Germany, which it is intended should serve as an index to its deficiencies, and to the methods by which they may be overcome, so as to give German manufacturers a better place in the market of the world.

**TRACK-LAYING MACHINE.**—The *Railway Age* has been shown the drawings of an invention of D. S. Moore, of Chicago. It is called a track-laying machine, and consists in a succession of rollers set in movable frames attached at will to the sides of several flat cars in a train, "elevated" so as to afford an inclined plane from rear to front. Upon these the ties on one side and the rails on the other, are easily rolled or laid by men upon the cars, when they move along over the rollers to the front, and are delivered to the tie and track layers as fast as they can use them. The object of the device is to obviate the use of teams in distributing ties along the road bed, especially over rough or swampy ground, and to save extra handling of the iron, as by the present way. The machine was tried recently on the Brainerd cut-off of the Northern Pacific road, and was highly approved by the contractor, Col. De Graff, General Rosser and others. This inventor claims that he can tie and iron a road with this appliance for from \$25 to \$50 per mile less than by the old method. It will dispense with many of the teams and hands now required, and enable the work to be done very rapidly.

**MAKING GLASS EYES.**—The processes are singularly simple, though, in some instances requiring great manipulative skill. The workman is provided with a number of thin glass rods, of the colors required. Heating the end of one of them by means of a blowpipe, he "gathers" from it sufficient for his purpose, on the end of a wire. This first gathering is generally of white or colorless glass, to form the white of the eye. He then takes the rod required to form the iris, and "gathers" from it on the white; and, lastly, a little spot from a black rod is added to form the pupil. During the process the "gathering" on the end of the wire is rotated in the flame of the blowpipe and occasionally pressed against a smooth surface to obtain perfect evenness of outline. In spite of the skill required in the manufacture and a considerable demand for the article, glass eyes are now greatly reduced in price, and the rate of wages of a few work people is very low.

**CURRENT FASHIONS IN JEWELRY.**—Silver jewelry has been and continues quite the rage in England, and the ear-rings made in this metal are certainly more artistic than their golden brethren, which seldom include the delightfully graceful and becoming "tassel" ear-rings, of which there are so many various patterns in silver. The lighter the workmanship of silver, the more becoming are the ornaments. Very pretty designs are daisies looped together by the stalks, a necklet of looped silver daisies to match, with pendant of one large marguerite; or silver fuchsia bells, with necklet of fuchsia leaves, and pendant of two or three blossoms. Filigree jewelry in gold and silver, is becoming fashionable again; but, though inexpensive, it so easily gets broken or discolored that it can scarcely be considered good value.

**NEW STEAM DREDGING MACHINE.**—A novel form of steam dredger was launched recently on the Thames, in which advantage is taken of the law of the equilibrium of fluids. In the side of the vessel, as far below the water-line as possible, a hole is made, to which a flexible pipe, carrying a nozzle of peculiar construction, is attached. The pipe is long enough to reach the bottom, and a current of water is caused to flow by the difference in level. This carries with it anything in the shape of mud or stones that will pass the nozzle, and when it reaches the hold of the dredger it is there driven out by a centrifugal pump into barges. The dredging is thus continuous.

**NEW ANTI-CORROSION FOR BOILERS.**—Bohlig, of Eisenach, prepares magnesia for the purpose of combining with the mineral salts usually found in the feed-water of boilers, and precipitating them without doing hurt to the boiler-plate. The preparation is said to separate the bicarbonates of calcium, magnesium and iron, precipitating at the ordinary temperatures, aluminates, silicates and similar bodies present in water. The water is mixed with the preparation before feeding, and fed direct into the boiler.

**A SELF-EXTINGUISHING FIRE.**—There is an invention shown at Omaha, the design of which is to put out the fire in a stove, in case the stove is wholly or partially upset, as in a railway accident. This is accomplished by surrounding the stove with a jacket containing water. Openings in the jacket communicate with the interior of the stove, so that if the ear is much tilted from a level, the water will flow into the stove and extinguish the fire.

**SEPARATION OF IRON ORE BY MAGNETISM.**—Mr. King of the Ballycorkish mines, Isle of Man, crushes his ore, which is composed of galena, blende, and sphatose iron ore, and after separating the galena, roasts the residue to a dull red heat in revolving retorts, thus producing a magnetic oxide of iron by decomposing the carbonate of that metal. The ore is then put into drum wheels having magnets arranged radially within; here the magnetic ore is separated by attraction and the blende left to escape clear.

## SCIENTIFIC PROGRESS.

### United Effort for Science.

One of the topics brought to the attention of the recent meeting of the American Association for the Advancement of Science was a plea that all nations should plan together about the work which they would each undertake, so that effort need not be wasted in any direction. This idea found enthusiastic championship in Professor Grote, who brought it forward. We propose to cite a few of the points which he made:

The existing national associations in this country and in Europe are performing excellent work, but there are questions to the answering of which their means are inadequate. Foremost among these is that of the origin of our species. Indispensable to a correct habit of thought is the solution of this question, and its elucidation must be sought for in regions outside of those inhabited by the more civilized nations. The various scientific explorations in Africa, Australia, and the polar regions need co-operative assistance to realize the best results from the outlays, while the new knowledge they bring is the common inheritance of all reading peoples. Justice, then, would require that where all participate all should contribute. The plan of the international scientific service here provisionally proposed embraces the appointment of commissioners by the civil governments of the world, whose deliberations would be the wisdom of the age, and whose recommendations would be respected by the legislative powers of the consenting and represented nations. Under their auspices all extra-limital astronomical, geographical and biological expeditions would be fitted out and directed to those places which would be more fruitful for the particular purpose. No longer would we be subjected to failures arising directly or indirectly from national prejudices. The difference in the mental faculties between different nations would prevent the loss in such a body of any possible suggestion the human intellect could afford.

From an economical point of view the outlay of the different governments for scientific expeditions would be lessened, and more effective work would be done. The amount to be contributed would be less, because the expenses of any expedition to be decided upon by the service would be made up by a quota from all the governments represented.

When science takes hold of the brotherhood of nations, and calls upon them to undertake the solution of vital problems for the common good, there must surely be a glorious response. Of the existing sympathy between nations we have many ready proofs: The Austrian polar expedition is rescued by "foreigners," and America returns to England the ship she lost in Northern ice. The flag of the International Scientific Service should be made neutral by treaty, and would be held sacred by all.

Professor Grote closed with the following proposition: As tending to break down social prejudice, as working in a direction toward both greater economy and greater result, I venture to lay the proposition before this association that it memorialize Congress to appoint commissioners on the part of the United States, who would inaugurate the formation of such an international scientific organization, and, by resolutions to be passed by this association, invite a similar action on the part of kindred scientific bodies in other lands as would influence their respective governments to assist in the enterprise. It seems to me that some such step as I now speak of will eventually be taken. If the plan proposed he now acted upon, it will be at least a fitting thing that it was commenced by a country that protects the alien, and allows liberty to all its inhabitants to pursue their happiness. And it would be well for America to move in any matter that will create an active sympathy between the nations in scientific matters.

### Another Electric Candle.

According to the *Telegraphic Journal*, M. Plante has called attention in the French Academy to the bright light obtained when an electrode of one of his secondary batteries (a powerful one) is applied to a glass tube or wall of glass vessel containing a saline solution. With the positive pole a stronger force is required; but the light is more silent than with the negative, which produces some crackling. When the light appears an abundant white vapor is given off, having a slight alkaline reaction. The glass is strongly attacked and de-verified. It might be thought that the brightness was due to lime combined in the silicon; but in the spectrum there are no appreciable lines except some traces of that of sodium; whereas a piece of lime spar, under the same conditions, gives distinctly the lines of calcium along with a continuous spectrum. The lines of silicon do not appear, being weak, and the spectrum being intensely luminous, just as the carbon lines are not perceptible in the spectrum from the voltaic arc. The silicic origin of the light is still further proved by the fact that it is obtained, likewise, on contact of the electrode with pure silicon in the state of crystal of hyaline quartz. M. Plante proposes to distinguish this kind of light as the *electro-silicic* light.

### Prehistoric Monsters.

Prof. Cope has recently described, under the name of *Camarasaurus supremus*, a saurian which appears to have been larger than any land animal yet known. The New York *Independent* says: It is represented by a larger part of the skeleton, which was dug from a bed of the Dakota epoch of the Cretaceous period, at a locality near to Canyon City, Colorado. It was discovered by Mr. O. W. Lucas, Superintendent of the public schools of that county. Its thigh bone measures more than six feet in length, and the expanse of some of the vertebrae is three and one-half feet. The vertebrae are of very light construction, their bodies being mere shells surmounting large hollow chambers. A neck vertebra is 20 inches long, giving at least 10 feet for the entire neck. The body must have been 10 or 12 feet in length. The specimen is very complete, Mr. Lucas having taken great pains to secure its preservation. A somewhat similar specimen was recently sent to the museum of Yale college, but this one is larger and in better preservation. Prof. Cope has also recently called attention to a number of teeth of a huge land saurian, which evidently inhabited Pennsylvania at an early geological period. The specimens were found by Charles M. Wheatley, of Phenixville, Pa., in one of the copper mines, in the red sandstone and shale which traverses the State from northeast to southwest, in the eastern section. This reptile, which is new to science, was probably 30 feet in length, with a bulky body, supported by heavy limbs. The teeth are double-edged and firmly serrate and of the kind characteristic of the carnivorous saurians. The reptile was, doubtless, one of the most formidable that ever inhabited the State, and, in point of time, the earliest. It has received the appropriate jaw-breaking name of *Pulocotonus Appalachianus*. What appeared to be a large bone of a similar animal was discovered not long ago in a sandstone quarry in Newport, N. J., but has not yet been described.

**IRON AND GLUE IN STREET DUST.**—In this country we have assays of street dust yielding gold in some towns, but glue and iron we have not searched for. We read in exchanges that Signor Parnetti has been engaged in analyzing the dust and debris of the streets of Florence and Paris. His investigation of the debris of the horse paths proves that the dust contains 35% of iron, given by the shoes of the horses to the stones. In the dust from the causeways this eminent chemist finds from 30% to 40% of good glue. Signor Parnetti selected and treated separately the dust from the causeways of the Boulevard des Capucines over a period of two months, which uniformly gave 30% of good transparent glue, it is said quite equal to Belfast. This eminent chemist is now engaged in the analysis of the dust and debris deposited by the shoe abrasions in Lombard street, Cornhill, Cheapside, and other thoroughfares of London, and has it in contemplation to place his discoveries at the disposal of a limited company, with the view of establishing blast furnaces on the banks of the Thames to recover the iron thus lost, and a large glue works, which, it is thought, will produce more glue from the wasted material than will supply all London for every purpose.

**GALLIUM.**—The new metal, gallium, discovered two years ago by M. Lecoq de Boisbaudran, is so slightly diffused that the discoverer had to employ half a ton of zinc from the Pierrefitte mine to get 12 grains of metallic gallium. It resembles pewter in color, is not so soft as lead, but can be bent and cut. When heated to redness, it assumes a slight tarnish, without being reduced to an oxide. It is very fusible, melting with the heat of the hand, forming a white globule, and would form a mirror, like mercury, if pressed between two glass plates. Though melting at a temperature of 86° F., it does not solidify again until considerably below that temperature. It is one of the lighter metals, having a specific gravity of 4.7. Some years ago, Mendeleeff, of St. Petersburg, made a study of the atomic weight of the elements, and arranged them in such groups that he thought he could predict the future discovery of elements. To one of these, situated between aluminium and indium, he assigned an atomic weight of 68; but whether gallium corresponds to the hypothetical element in this respect does not seem to be well determined.

**PURIFYING IRON WITH CHLORINE.**—William Baker, of Sheffield, England, has invented a process of eliminating phosphorus from molten cast-iron, which consists in the employment of chlorine, which, by being injected into or by being brought into contact with the molten cast-iron, effects the separation in part, or practically entirely, of the phosphorus from the impure cast-iron. In carrying out this invention, he injects or passes into or brings into contact with the fluid molten cast-iron, chlorine in a gaseous form, and he prefers to submit the molten cast-iron to the action of chlorine before it has been subjected to the action of air, as, for example, in the Bessemer process or in the ordinary puddling process, or to other decarburizing processes. Although he has mentioned the employment of chlorine-gas, chlorine, in conjunction with other gases, may be employed; but he prefers to employ chlorine.



Table of Highest and Lowest Sales in S. F. Stock Exchange.

Name of Company.	Week Ending Sep. 13.	Week Ending Sep. 20.	Week Ending Sep. 27.	Week Ending Oct. 4.
Alpha.	12 1/2	11 1/2	13 1/2	14 1/2
Alta.	4	3 1/2	3 1/2	3 1/2
Andes.	60c	75c	75c	65c
Baltimore Con.	50c	50c	50c	50c
Belcher.	75c	75c	75c	75c
Best & Belcher.	20c	20c	20c	20c
Bullion.	30c	30c	30c	30c
Caledonia.	30c	30c	30c	30c
California.	30c	30c	30c	30c
Challenger.	30c	30c	30c	30c
Chollar-Potosi.	30c	30c	30c	30c
Confidence.	30c	30c	30c	30c
Con Imperial.	30c	30c	30c	30c
Con Virginia.	30c	30c	30c	30c
Crown Point.	30c	30c	30c	30c
Coso Con.	30c	30c	30c	30c
Dayton.	30c	30c	30c	30c
Eureka Con.	30c	30c	30c	30c
Eschquer.	30c	30c	30c	30c
Geddes & Bertrand.	30c	30c	30c	30c
Gen Thomas.	30c	30c	30c	30c
Grand Prize.	30c	30c	30c	30c
Globe Con.	30c	30c	30c	30c
Golden Chariot.	30c	30c	30c	30c
Gould & Curry.	30c	30c	30c	30c
Hale & Norcross.	30c	30c	30c	30c
Hussey.	30c	30c	30c	30c
Imperial.	30c	30c	30c	30c
Justice.	30c	30c	30c	30c
Knickerbocker.	30c	30c	30c	30c
Kosuth.	30c	30c	30c	30c
Lady Wash.	30c	30c	30c	30c
Leopard.	30c	30c	30c	30c
Leviathan.	30c	30c	30c	30c
Leeds.	30c	30c	30c	30c
Manhattan.	30c	30c	30c	30c
Mansfield.	30c	30c	30c	30c
Meadow Valley.	30c	30c	30c	30c
Mexican.	30c	30c	30c	30c
North Con Virginia.	30c	30c	30c	30c
New York.	30c	30c	30c	30c
Niagara.	30c	30c	30c	30c
Northern Belle.	30c	30c	30c	30c
New Coso.	30c	30c	30c	30c
Occidental.	30c	30c	30c	30c
Ophir.	30c	30c	30c	30c
Overman.	30c	30c	30c	30c
Pacific.	30c	30c	30c	30c
Phil Sheridan.	30c	30c	30c	30c
Pioneer.	30c	30c	30c	30c
Prospect.	30c	30c	30c	30c
Raymond & Ely.	30c	30c	30c	30c
Rock Island.	30c	30c	30c	30c
Sage.	30c	30c	30c	30c
Sebelcher.	30c	30c	30c	30c
Sierra Nevada.	30c	30c	30c	30c
Silver Hill.	30c	30c	30c	30c
South Chariot.	30c	30c	30c	30c
Succor.	30c	30c	30c	30c
Trojan.	30c	30c	30c	30c
Union Con.	30c	30c	30c	30c
Utah.	30c	30c	30c	30c
Wells Fargo.	30c	30c	30c	30c
Woodville.	30c	30c	30c	30c
Yellow Jacket.	30c	30c	30c	30c

Sales at S. F. Stock Exchange.

FRIDAY, A. M., SEPT. 28.	1000 Raymond & Ely.	11c	1000
2460 Alta.	11c	1000	
85 Andes.	75c	1000	
150 Alpha.	150c	1000	
120 Benton.	120c	1000	
785 Boyle.	785c	1000	
785 Bullion.	785c	1000	
835 Belcher.	835c	1000	
195 Best & Belcher.	20c	1000	
330 Con Washoe.	330c	1000	
1500 Cherokee.	1500c	1000	
3750 Con Imperial.	3750c	1000	
110 Chollar.	110c	1000	
885 Crown Point.	885c	1000	
400 California.	400c	1000	
105 Con Virginia.	105c	1000	
170 Caledonia.	170c	1000	
100 Confidence.	100c	1000	
460 Challenger.	460c	1000	
2030 Dayton.	2030c	1000	
300 Dardanelles.	300c	1000	
595 Eschquer.	595c	1000	
590 Gould & Curry.	590c	1000	
670 Hale & Nor.	670c	1000	
400 Joe Scates.	400c	1000	
7105 Justice.	7105c	1000	
460 Julia.	460c	1000	
600 Kosuth.	600c	1000	
1500 Kentuck.	1500c	1000	
3010 Lady Wash.	3010c	1000	
150 Leviathan.	150c	1000	
225 Mexican.	225c	1000	
3700 Monumental.	3700c	1000	
3745 New York.	3745c	1000	
100 Niagara.	100c	1000	
260 Overman.	260c	1000	
300 Occidental.	300c	1000	
365 Ophir.	365c	1000	
700 Peytona.	700c	1000	
800 Rock Island.	800c	1000	
460 Sierra Nevada.	460c	1000	
160 Savage.	160c	1000	
200 South Comstock.	200c	1000	
700 South Justice.	700c	1000	
1990 Succor.	1990c	1000	
3355 Silver Hill.	3355c	1000	
300 Trojan.	300c	1000	
680 Union Con.	680c	1000	
80 Utah.	80c	1000	
1175 Woodville.	1175c	1000	
170 Ward.	170c	1000	
970 Yellow Jacket.	970c	1000	
AFTERNOON SESSION.			
1675 Argenta.	1675c	1000	
1000 Alpha.	1000c	1000	
2305 Alta.	2305c	1000	
625 Benton.	625c	1000	
800 Bodie.	800c	1000	
205 Best & Belcher.	205c	1000	
1500 Bullion.	1500c	1000	
2120 Combination.	2120c	1000	
1420 Crown Point.	1420c	1000	
450 California.	450c	1000	
1170 DeFrees.	1170c	1000	
1610 Dayton.	1610c	1000	
50 Empire Id.	50c	1000	
1900 Endowment.	1900c	1000	
150 Eureka Con.	150c	1000	
510 Eschquer.	510c	1000	
450 Grand Prize W.	450c	1000	
200 Golden Chariot.	200c	1000	
500 Gold Prize.	500c	1000	
575 Gila.	575c	1000	
175 Gould & Curry.	175c	1000	
600 Hussey.	600c	1000	
70 Hale & Nor.	70c	1000	
100 Independent.	100c	1000	
300 Jackson.	300c	1000	
7155 Justice.	7155c	1000	
1075 Lady Wash.	1075c	1000	
745 Leopard.	745c	1000	
120 Leads.	120c	1000	
1300 Mansfield.	1300c	1000	
550 Modoc.	550c	1000	
135 Manhattan.	135c	1000	
170 Meadow Valley.	170c	1000	
70 Mexican.	70c	1000	
75 Northern Belle.	75c	1000	
50 New Coso.	50c	1000	
580 Navajo.	580c	1000	
305 Ophir.	305c	1000	
140 Overman.	140c	1000	
50 Phenix.	50c	1000	

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550 Alps.	550c	1000	1200 Northern Belle.	1200c	1000
350 Benton.	350c	1000	1000 New Coso.	1000c	1000
150 Baltimore Con.	150c	1000	100 Phenix.	100c	100
100 Bodie.	100c	1000	250 Peytona.	250c	100
4100 Benton.	4100c	1000	450 Prospect.	450c	100
1975 Boyle.	1975c	1000	1100 Panther.	1100c	100
120 Challenger.	120c	1000	925 Corona & Ely.	925c	100
1500 Cherokee.	1500c	1000	1500 Silver Prize.	1500c	100
1810 Combination.	1810c	1000	400 South Justice.	400c	100
1300 Dayton.	1300c	1000	3050 Trojan.	3050c	100
700 DeFrees.	700c	1000	1000 Union Con.	1000c	100
1100 Endowment.	1100c	1000	950 Wells-Fargo.	950c	100
100 El Dorado S.	100c	1000	680 Ward.	680c	100
85 Eureka Con.	85c	1000	500 Woodville.	500c	100
935 Grand Prize W.	935c	1000	1000 Young America.	1000c	100
575 Gila.	575c	1000	1100 WEDNESDAY A. M. OCT. 1.		
1250 Hussey.	1250c	1000	1120 Andes.	1120c	100
1100 Independent.	1100c	1000	215 Alpha.	215c	100
400 Joe Scates.	400c	1000	1150 Best & Belcher.	1150c	100
1100 Kosuth.	1100c	1000	763 Bullion.	763c	100
1180 Leopard.	1180c	1000	300 Baltimore Con.	300c	100
1250 Leviathan.	1250c	1000	260 Benton.	260c	100
265 Leads.	265c	1000	950 Caledonia.	950c	100
2025 Modoc.	2025c	1000	1550 Cherokee.	1550c	100
600 Monumental.	600c	1000	2580 Con Washoe.	2580c	100
1400 Mansfield.	1400c	1000	740 California.	740c	100
605 New Coso.	605c	1000	220 Confidence.	220c	100
2130 Navajo.	2130c	1000	925 Con Virginia.	925c	100
55 Northern Belle.	55c	1000	200 Chollar.	200c	100
1680 North Con Vir.	1680c	1000	1455 Crown Point.	1455c	100
200 Occidental.	200c	1000	18150 Con Imperial.	18150c	100
500 Panther.	500c	1000	1000 Dardanelles.	1000c	100
150 Peytona.	150c	1000	790 Dayton.	790c	100
425 Phil Sheridan.	425c	1000	300 Dardanelles.	300c	100
250 Prospect.	250c	1000	1530 Eschquer.	1530c	100
170 Rye Patch.	170c	1000	500 Globe.	500c	100
30 Raymond & Ely.	30c	1000	1010 H. & Nor.	1010c	100
200 Rock Island.	200c	1000	1830 H. & Nor.	1830c	100
250 Star.	250c	1000	1830 H. & Nor.	1830c	100
1750 Silver Prize.	1750c	1000	1830 H. & Nor.	1830c	100
2235 Silver Hill.	2235c	1000	1830 H. & Nor.	1830c	100
2025 South Justice.	2025c	1000	1830 H. & Nor.	1830c	100
705 South Con Vir.	705c	1000	1830 H. & Nor.	1830c	100
700 Trojan.	700c	1000	1830 H. & Nor.	1830c	100
1735 Ward.	1735c	1000	1830 H. & Nor.	1830c	100
1065 Woodville.	1065c	1000	1830 H. & Nor.	1830c	100
WEDNESDAY, A. M., OCT. 1.			1830 H. & Nor.	1830c	100
540 Alpha.	540c	1000	1830 H. & Nor.	1830c	100
1185 Alta.	1185c	1000	1830 H. & Nor.	1830c	100
455 Andes.	455c	1000	1830 H. & Nor.	1830c	100
195 Belcher.	195c	1000	1830 H. & Nor.	1830c	100
200 Best & Belcher.	200c	1000	1830 H. & Nor.	1830c	100
100 Baltimore Con.	100c	1000	1830 H. & Nor.	1830c	100
1175 Bullion.	1175c	1000	1830 H. & Nor.	1830c	100
335 California.	335c	1000	1830 H. & Nor.	1830c	100
195 Chollar.	195c	1000	1830 H. & Nor.	1830c	100
425 Con Virginia.	425c	1000	1830 H. & Nor.	1830c	100
40 Confidence.	40c	1000	1830 H. & Nor.	1830c	100
8365 Con Imperial.	8365c	1000	1830 H. & Nor.	1830c	100
1100 Crown Point.	1100c	1000	1830 H. & Nor.	1830c	100
300 Caledonia.	300c	1000	1830 H. & Nor.	1830c	100
500 Daney.	500c	1000	1830 H. & Nor.	1830c	100
1850 Dayton.	1850c	1000	1830 H. & Nor.	1830c	100
400 Dardanelles.	400c	1000	1830 H. & Nor.	1830c	100
2245 Eschquer.	2245c	1000	1830 H. & Nor.	1830c	100
530 Gould & Curry.	530c	1000	1830 H. & Nor.	1830c	100
950 Hale & Nor.	950c	1000	1830 H. & Nor.	1830c	100
2230 Justice.	2230c	1000	1830 H. & Nor.	1830c	100
2835 Julia.	2835c	1000	1830 H. & Nor.	1830c	100
255 Kentuck.	255c	1000	1830 H. & Nor.	1830c	100
300 Kosuth.	300c	1000	1830 H. & Nor.	1830c	100
1650 Lady Wash.	1650c	1000	1830 H. & Nor.	1830c	100
80 Mexican.	80c	1000	1830 H. & Nor.	1830c	100
3925 New York.	3925c	1000	1830 H. & Nor.	1830c	100
220 Ophir.	220c	1000	1830 H. & Nor.	1830c	100
800 Overman.	800c	1000	1830 H. & Nor.	1830c	100
150 Occidental.	150c	1000	1830 H. & Nor.	1830c	100
200 Phil Sheridan.	200c	1000	1830 H. & Nor.	1830c	100
450 Rock Island.	450c	1000	1830 H. & Nor.	1830c	100
565 Sierra Nevada.	565c	1000	1830 H. & Nor.	1830c	100
670 Savare.	670c	1000	1830 H. & Nor.	1830c	100
1560 Succor.	1560c	1000	1830 H. & Nor.	1830c	100
450 South Comstock.	450c	1000	1830 H. & Nor.	1830c	100
115 Silver Hill.	115c	1000	1830 H. & Nor.	1830c	100
565 Union Con.	565c	1000	1830 H. & Nor.	1830c	100
155 Utah.	155c	1000	1830 H. & Nor.	1830c	100
1670 Woodville.	1670c	1000	1830 H. & Nor.	1830c	100
295 Yellow Jacket.	295c	1000	1830 H. & Nor.	1830c	100
AFTERNOON SESSION.			1830 H. & Nor.	1830c	100
1200 Argenta.	1200c	1000	1830 H. & Nor.	1830c	100
320 Alpha.	320c	1000	1830 H. & Nor.	1830c	100
1565 Alta.	1565c	1000	1830 H. & Nor.	1830c	100
1300 Andes.	1300c	1000	1830 H. & Nor.	1830c	100
1540 Benton.	1540c	1000	1830 H. & Nor.	1830c	100
1465 Boyle.	1465c	1000	1830 H. & Nor.	1830c	100
450 Bechtel.	450c	1000	1830 H. & Nor.	1830c	100
1910 Bullion.	1910c	1000	1830 H. & Nor.	1830c	100
1480 Cherokee.	1480c	1000	1830 H. & Nor.	1830c	100
300 Combination.	300c	1000	1830 H. & Nor.	1830c	100
300 Con Virginia.	300c	1000	1830 H. & Nor.	1830c	100
440 California.	440c	1000	1830 H. & Nor.	1830c	100
415 Con Imperial.	415c	1000	1830 H. & Nor.	1830c	100
1450 Con Washoe.	1450c	1000	1830 H. & Nor.	1830c	100
1200 DeFrees.	1200c	1000	1830 H. & Nor.	1830c	100
1000 Endowment.	1000c	1000	1830 H. & Nor.	1830c	100
500 Eschquer.	500c	1000	1830 H. & Nor.	1830c	100
100 Golden Chariot.	100c	1000	1830 H. & Nor.	1830c	100
1400 Grand Prize W.	1400c	1000	1830 H. & Nor.	1830c	100
800 Gila.	800c	1000	1830 H. & Nor.	1830c	100
420 Gould & Curry.	420c	1000	1830 H. & Nor.	1830c	100
340 Hussey.	340c	1000	1830 H. & Nor.	1830c	100
1200 Independent.	1200c	1000	1830 H. & Nor.	1830c	100
1835 Justice.	1835c	1000	1830 H. & Nor.	1830c	100
310 Joe Scates.	310c	1000	1830 H. & Nor.	1830c	100
750 Jackson.	750c	1000	1830 H. & Nor.	1830c	100
80 K K Con.	80c	1000	1830 H. & Nor.	1830c	100
80 Kosuth.	80c	1000	1830 H. & Nor.	1830c	100
1400 Leopard.	1400c	1000	1830 H. & Nor.	1830c	100
1000 Leads.	1000c	1000	1830 H. & Nor.	1830c	100
1155 Manhattan.	1155c	1000	1830 H. & Nor.	1830c	100
THURSDAY, A. M., SEPT. 27.			1830 H. & Nor.	1830c	100
430 Alpha.	430c	1000	1830 H. & Nor.	1830c	100
2200 Alta.	2200c	1000	1830 H. & Nor.	1830c	100
520 Bullion.	520c	1000	1830 H. & Nor.	1830c	100
605 Belcher.	605c	1000	1830 H. & Nor.	1830c	100
935 Best & Belcher.	935c	1000	1830 H. & Nor.	1830c	100
300 Baltimore Con.	300c	1000	1830 H. & Nor.	1830c	100
105 Confidence.	105c	1000	1830 H. & Nor.	1830c	100
2490 Con Imperial.	2490c	1000	1830 H. & Nor.	1830c	100
115 Crown Point.	115c	1000	1830 H. & Nor.	1830c	100
25 Chollar.	25c	1000	1830 H. & Nor.	1830c	100
100 Con Virginia.	100c	1000	1830 H. & Nor.	1830c	100
10 Challenge.	10c	1000	1830 H. & Nor.	1830c	100
745 California.	745c	1000	1830 H. & Nor.	1830c	100
740 Caledonia.	740c	1000	1830 H. & Nor.	1830c	100
3630 Dayton.	3630c	1000	1830 H. & Nor.	1830c	100
1410 Eschquer.	1410c	1000	1830 H. & Nor.	1830c	100
810 Gould & Curry.	810c	1000	1830 H. & Nor.	1830c	100
1855 Hale & Nor.	1855c	1000	1830 H. & Nor.	1830c	100
2420 Justice.	2420c	1000	1830 H. & Nor.	1830c	100
435 Kentuck.	435c	1000	1830 H. & Nor.	1830c	100
105 Mexican.	105c	1000	1830 H. & Nor.	1830c	100
2040 New York.	2040c	1000	1830 H. & Nor.	1830c	100
350 Overman.	350c	1000	1830 H. & Nor.	1830c	100
200 Ophir.	200c	1000	1830 H. & Nor.	1830c	100
25 Occidental.	25c	1000	1830 H. & Nor.	1830c	100
600 Rock Island.	600c	1000	1830 H. & Nor.	1830c	100
565 Sierra Nevada.	565c	1000	1830 H. & Nor.	1830c	100
630 Silver Hill.	630c	1000	1830 H. & Nor.	1830c	100
1110 Succor.	1110c	1000	1830 H. & Nor.	1830c	100
240 Utah.	240c	1000	1830 H. & Nor.	1830c	100
590 Union Con.	590c	1000	1830 H. & Nor.	1830c	100
835 Yellow Jacket.	835c	1000	1830 H. & Nor.	1830c	100
AFTERNOON SESSION.			1830 H. & Nor.	1830c	100
1570 Alta.	1570c	1000	1830 H. & Nor.	1830c	100
50 Alpha.	50c	1000	1830 H. & Nor.	1830c	100
420 Andes.	420c	1000	1830 H. & Nor.	1830c	100
350 Alps.	350c	1000	1830 H. & Nor.	1830c	100
1490 Argenta.	1490c	1000	1830 H. & Nor.	1830c	100
380 Belcher.	380c	1000	1830 H. & Nor.	1830c	100
200 Benton.	200				



# MINING SUMMARY.

The following is mostly condensed from journals published in the interior, in proximity to the mines mentioned.

## California.

### AMADOR.

**MONTICLARE.**—Amador Ledger, Sept. 29. A contract for sinking an additional 100 feet was let Saturday, the work to be commenced forthwith. When completed, this will make a total depth of 250 feet. If the ore body is found to hold out at this depth, we understand the company will feel justified in erecting a small mill. The shareholders are a little scared about involving themselves in much expense in operating the claim. The mine is of the main belt, and croakers have continually prophesied that the ore would peter out. If, however, as the depth of the vein, the ledge remains intact in size and richness, there will be enough ore in sight to warrant the putting up of a mill.

**MAHONEY.**—The case involving the management of the Mahoney will not come up in the United States Court until January. In the meantime the mine is at a standstill, to the great detriment of Silver Creek. The mine is in the hands of the Mahoney, who is being developed. Doyle is talking about putting up an assayer to crush some of the richest ore he has taken out.

**VOLCANO ITEMS.**—Our quartz interests are generally improving. J. Orlbach is making another crushing of 120 tons at the Mace mill. It is averaging \$50 per ton. At the Downs mine they are still sinking with good prospects. Rodgers & Ely have struck a rich body of ore in the lower part of the claim, in what is known as the Gantler mine. The confidence has suspended work, pending settlement of title. I understand that the Golden Gate will start as soon as the water can be had to run the machinery. J. B. Pine is taking out fair ore over on the river. The Rising Sun company are waiting for water. The last crushing didn't pay. I am told by an old mill man that they did not understand assaying, consequently lost both gold and quicksilver. There are some parties in town at present from the Jo Davis mine, situated four miles southeast of Cable's ranch, on the other side of the Carson spur, who state that they have prospected six ledges in that vicinity, and the rock will average \$50 per ton, some assaying as high as \$1,700 per ton. They have a townsite surveyed, an inexhaustible supply of water and mill race, and plenty of timber. One would think there is a chance for a lively camp there next season.

**PLYMOUTH.**—The Phoenix race from the mill is finished, and men are now raising the sides of the flume above the mill, so as to secure more motive power. Sinking in the two shafts is completed, and drifting on the lower level has commenced. Large quantities of ore are being taken out before the mill starts, so as to keep 80 stamps running the whole season.

**MR. DAVIS.** one of our enterprising capitalists, has purchased the 10-stamp mill of Wheeler & Tregloan, and intends to put it up on a mine north of Dry creek, on the line of the Phoenix lode.

**CANONS OF MEN** are at work on the line of the ditch. The tunnel three miles north of town is being timbered and planked, and will be finished this week. For two months past men have been blasting a channel in the middle fork of the Cosumnes, to enable the company to float timber down the river next season to the head of the ditch. All kind of work connected with the Phoenix is pushed with vigor. At no time has the management of the mine been more efficient or energetic than now.

### BUTTE.

**BEAUTIFUL GOLD.**—Oroville Mercury, Sept. 29. Mr. and Mrs. Rhoades, of Magalia, arrived in town a few days ago and put up at the Chico hotel. While there, Mr. Rhoades showed some of the gold he had taken from his claim within the past six weeks sided only by his wife. A large number of hands of gold nuggets is a rare thing to see, but the lady and gentleman had that and more too. The pieces would weigh from \$1 to \$165. They have averaged \$125 a day during the time they have been at work.

### CALAVERAS.

**RICH ROCK.**—Calaveras Citizen, Sept. 29. We were shown specimens of gold-bearing quartz, this week, from the Potter mine, situated near Mosquito. The gold was evenly distributed through the rock and makes very handsome specimens, and the beauty of the thing—to Mr. Potter—is that there is plenty more where that came from.

**LOOKS WELL.**—Work on the Thorpe mine progresses favorably and the rock looks exceedingly well. As soon as the wheel and additional battery of five stamps is finished, we shall expect a good return from this mine. If the parties who own this ledge had the means to erect suitable machinery upon it, they could coin money. There is no doubt of that fact.

### LAKE.

**QUICKSILVER.**—See, Sept. 29. The Mount Jackson quicksilver mine, near Cuernavaca, has been started up. Good pay is expected by the owners. The Redington mine shipped 646 flasks of quicksilver in August, making 72,369 pounds, or over 30 tons of liquid mercury.

### MERCED.

**TUR MIXES.**—Mariposa Gazette, Sept. 29. The mines about Hornitos are assuming shape and are worthy of more than a passing notice, for never since mining operations first began in this region did the prospect look so bright as at present being worked exhibit such symptoms and positive indications of success as they do at the present time. The Duncan mine, which, in former days, yielded a great amount of gold, is now being worked by Jerome B. Brown & Co., who have taken out within a short time \$3,000. Jean Martin is the owner of a rich quartz mine. He has taken therefrom, of late, in about two weeks' time, \$15,000. This, as we understand, was a rich pocket and did not require the use of a mill. He also had some rock crushed at the Oats mill, which yielded upwards of \$170 per ton. Davidson & McMillan recently commenced work on their mine near Indian gulch, and on the second day took out \$1,000. J. M. Ross has bought a new mill, which he intends to erect at his valuable mine, on the Bear Valley mountain. A. Campodonico is under full headway with his mine and mill, which promises success. Harbeck & Co., near Pool's ranch, have struck rich rock in their mine. Royal's mine, near Tuleto gulch, has turned out some very rich ore. The old Wilson mine is being opened with a good prospect. The Washington mine is making many improvements, which indicates prosperity. At Mormon Bar, the Mercer mine has been started up. This river claim pays from \$1,000 to \$1,500 per week.

### NEVADA.

**BIG GAZ MINE.**—Nevada Gazette, Sept. 29. What was formerly known as the Buckham ledge, located about two miles from Bear River, in the lower part of this county, has recently changed hands, and work has been commenced to open it. John Hirsch, Kelly & Co. are the present owners. Two shafts have been sunk upon it to a depth of 100 feet. The ledge at that depth averages from one to two feet in width, and the rock which has been taken out has paid \$25 per ton. A mill will soon be erected to crush the rock for the mine of the company and will also crush custom rock. There is an extensive belt of quartz in that vicinity, but as yet little work has been done upon it.

**PROVIDENCE.**—First-class fine milling ore continues to come from the 100-ft level of the Providence mine. The mill is being overhauled, self-feeders being put up to each battery, and other improvements made, so that as soon as water comes things can be rushed ahead.

**THE NEVADA.**—Super. Berry is driving ahead with his incline, and expects in about six weeks to be down far enough to open a new level. Water is so scarce that but

five stamps in the mill can be run, and then only part of the time. Before the another dry season comes a connection will be made with the engines in the hoisting works so that no delays will occur.

The ledge located out beyond Plety Hill, near the old Turner place, is again being worked. It is owned by J. H. Richards, W. H. Martin and the Cleave brothers. Twenty-seven tons of the rock, recently worked, yielded in the neighborhood of \$15 per ton. The company are unable to put up machinery, unless they can dispose of a portion of the claim.

George Smith's mine, near the Half-Mile House, continues to look splendidly. Stopping and drifting is going on on each side of the shaft. In the east drift, 250 feet from the shaft, the best chute of ore yet found in the mine has been struck. The ledge there is of good size and is liberally sprinkled with gold.

The New England is still turning out first-class ore from the lower level, where the ledge is from two to four feet in thickness. The hoisting works are in good running order and everything ready for pushing developments. The Crosby reduction works will soon be in operation near the New England, and will work all the ore from that mine.

The Gold Spring mining company, near the old Turner place, have taken up the abandoned shaft through the ledge, and they have been working, and are going over to the other side of the ridge and start a tunnel to tap the channel.

There is considerable prospecting going on again in this district. There are any number of undeveloped ledges in this vicinity that will pay amply wages for work upon them while being prospected, and some are wise enough to get out and go to work upon them.

The owners of the Blue Point Union Consolidated mining company, of Smartsville, have been engaged the past month in repairing the ditch which conveys water from Wolf creek, at a point near Forest Springs, to their mine. They found all the flumes in an advanced state of decay, and are putting new ones wherever needed. It required a large amount of money, and some had to be done. Wolf, Crosby has discovered a ledge near the new site of the Pioneer reduction works, on the Grass Valley road, and has put men upon it to test its value.

Work is progressing in the Watt Blue Cravel mine shaft near Moore's Flat, and it is expected to reach bed rock inside two months. All in that section of country are praying for the success of this mine, as it will assure that they are not working on a dud.

What is known as the Tully ledge, situated at Selby Flat, has been re-located by some miners and work is being done to open it up. It used to be considered a valuable ledge.

The ledge which runs parallel with the Nevada and Providence mines, on the west side, is again being worked and a quantity of ore is being taken out through a tunnel.

We understand the rock from the Murchie mine continues to look well, and the prospects are very flattering. **MACHINEAY GOLD.**—Nevada Transcript, Sept. 30. A short time ago Geo. G. Allan, of the Nevada foundry, purchased the machinery of the Union mine company, at Grass Valley. He has sold it to the Ploocene company, of Forest City, and it is being hauled to that place.

Whitely's team, Mr. Allan has also sold to the same company a 90-horse power steam engine. The Nevada foundry is now turning out a large amount of machinery for several mining companies in this and Sierra counties.

**THE RABBIT.**—We interviewed a gentleman yesterday who had recently visited North Bloomfield, Moore's Flat and other places on the ridge. From his observations we are enabled to give you some items of interest. The mining prospects never looked better than it does now at North Bloomfield and its immediate vicinity. New and very extensive mining enterprises are going on, and a large number of men are employed. If the Derbec and Watt companies strike the gravel they are going for, and there is scarcely a doubt about the matter, hundreds of men will be added to the number already employed.

Two companies are driving ahead with all possible dispatch. The North Bloomfield has sufficient water to work for three weeks longer, and then they will proceed to get everything in order for more extensive work by the time the rainy season sets in. At Moore's Flat there are only two sets of digging running, on account of the lack of water.

**LOWELL AND LABERY HILL.**—Grass Valley Union, Sept. 29. Mr. Byrnes, Jr. has just returned from the Planet mine in Lowell Hill district, and reports everything there to be in the most encouraging condition. The tunnel, which is the largest in the county, is in 334 feet, and is a nice piece of workmanship, being as true and straight as a rule. The contractors were somewhat annoyed by the smoke from their blast hanging too long, near the edge of the tunnel, and this had quite an ingenious party to discharge it. They put in six-inch pipe the whole length of the tunnel, and at the entrance put an elbow and ran the pipe up in the air, by a pine tree, about 50 feet high. They then built a stone furnace, with a pipe leading from the fire to the elbow and up the perpendicular pipe; a fire built in the furnace completed this work and caused a draft from the furnace, the smoke from the horizontal pipe, and the blast pipe, and the smoke from the furnace would pull a bonfire on her nest. No more smoke or bad air for the Planet boys. Mr. Byrnes thinks they will tap the gravel in about 700 feet, and if he is correct it will be seen that the work is almost half completed. He will have a survey made next week, which will determine exactly the distance to be made. The company's financial condition is such, we are glad to say, as to equal the completion of this Grass Valley enterprise, and we confidently believe that the Planet will prove to be one of the most valuable mines in the State.

**Wm. P. Dewey, Esq.,** of San Francisco, has purchased the Leary ground, which is within 1,800 feet of the Planet. This 1,800 feet front comprises the "Mud Spring Ranch mine," owned by F. T. Maguire, Esq., of Liberty Hill. Mr. Dewey has let a contract for this Grass Valley enterprise, and the completion of this bedrock tunnel to the gravel banks is already under way. Mr. Dewey has a splendid piece of ground, and in that it runs from Steep Hollow to Bear River he has a dead sure thing on the pay channel, and we expect good returns for him when he gets his tunnel in. Maguire's mine is very favorably situated, being between the Planet and Dewey's; the work on each of these prospects is being carried on with the same vigor, and the work of running out the Nevada Enterprise mine, on the same lead, at Remington hill, is yielding richer than ever, and is the boss of the district. The Swamp Angel has its dumps full to overflowing, but their water is temporarily stopped, so we could get no late items from them, further than they have not yet cut through the gravel deposit, although they penetrated it over 800 feet. That ridge will boom in another year.

### SAN BENITO.

**HERMANDEY VALLEY.**—Cor. Hollister Enterprise: First in order was the famous old Hollister mine. Thousands of dollars have been expended in the development of this property, but to-day it remains idle. A pity, as I think by judicious management the property would pay well. Next follows the mines south of it, the Nevada Enterprise, owned by Ross, Sanchez, Sargent and others. A small open cut on the ledge has produced about \$5,000. It is the intention of the company to resume work at an early day. The Cody mine shows finely. The furnace of four tons will, in a few days, be in running order, when about eight flasks per week will be taken out. A 10-ton perpetual furnace will soon be erected, when there will be work for 100 men or more.

### SANTA BARBARA.

**LOS PRIETOS.**—Santa Barbara Express, Sept. 29. The Los Prietos quicksilver mine has again been a fair way to make a good show. Mr. J. A. Shedd, who lately returned from thence, reports the furnace in working order and a large amount of ore ready for use. Condensation is to commence about the middle of the present week.

### SANTA CRUZ.

**QUIL LANDS.**—Santa Cruz Courier, Sept. 28. We learn that some San Francisco capitalists have taken an active interest in the oil discoveries in this county, and are joining in with those already at work there to develop the claims as fast as possible. It is said that the company

have leased still another large tract of land and are now busy erecting machinery.

### SIERRA.

**NORTH FORK.**—Mountain Messenger, Sept. 29. Wm. McDougal has been appointed Superintendent of the North Fork mining claims, at Forest City. The company are still running ahead for the channel.

**NORTH AMERICA.**—The North America mine, at Newark, has paid very well this year, considering the losses they met with by fire late last fall, and the disadvantages under which it placed the mine. The mine has paid up that loss and a dividend besides.

**JUSTICE.**—The Junetta company have commenced a tunnel in Wallace creek, below Gibson, for the purpose of opening a tract of mining ground known to be rich. The cut is finished and the tunnel just under cover. This is an important enterprise, as it will test a gravel range, and, if successful, will make things very lively at Gibsonville.

## Nevada.

### WASHOE.

**OVERMAN.**—Gold Hill News, Oct. 3. The main drift south, as well as the crosscut east at the 1400-ft level, develops nothing of interest as yet. The connection between the 1300 and 1200-ft levels was expected to be made to-day, and is probably completed. The connection between the Belcher air shaft and the 2000-ft level of the Crown Point has had the effect to cool off the 1400-ft level of the Caledonia considerably.

**TWIN PEAKS.**—Work is being actively resumed after a few months' rest. The water is all out, and as soon as possible steam hoisting works are to be erected at the new working shaft. The machinery is already engaged. A ledge 72 feet wide between the walls, and nearly 100 feet in length, is developed, some portions of which give low assays.

**SILVER HILL.**—During the past four days have been drifting north on the 950-ft level toward the Justice, and making about six feet a day. Less water is being encountered than before the mine was shut down. The water from the 650-ft level has been drained within 40 feet of the 800-ft level.

**JUSTICE.**—Daily yield, 400 tons from the regular producing sections. The south lateral drift, on the 1150-ft level is pushing ahead and showing fair milling ore. The drift south, on the 1000-ft level, shows some improvement, and the surface above this level continues in good ore. The winze below this level is in hard blasting work.

**SOUTH COMSTOCK.**—A. Caldwell, the newly-appointed Superintendent, arrived this morning and took charge of the mine to-day. He is to start work in the mine again as soon as he can get the steam hoisting works.

**BEST & BELCHER.**—Work not resumed at the 1500-ft level, but will be soon, as the air is improving. The connection with the Savage and Gould & Curry at the 1000-ft level is expected to be completed by the end of this week.

**BULLION.**—At the 1700-ft level the east cross-cut is being pushed ahead at a lively rate, with the face still in porphyry and quartz.

**SIERRA NEVADA.**—Main drift north at the 1250-ft level, to connect with the Utah mine, is making good, steady progress. At the 1750-ft level the drift south from the shaft is progressing well.

**GOULD & CURRY.**—Drifts both north and south at the 1000-ft level are making steady progress. The connection with the Savage will be completed in four or five days.

**CON. VIRGINIA.**—Daily yield, 550 tons of ore, from the regular producing sections, keeping all the mills running steadily, with a large surplus accumulating at each. The 1650-ft level continues to be the main source of revenue in this respect, and the ore breasts and stopes, especially the southward and westward, are constantly being extended in those directions. The main drift west from the C. & C. shaft at this level has a little less than 100 feet to run in order to connect with the main Cou. Virginia shaft, which is being sunk deeper for that purpose. The connection will be completed in about two months from now. The face of the drift is in low grade ore. At the 1750-ft level the main C. & C. drift west has not yet got through the porphyry into the west ore vein, but it is expected to at any time. On the 1550-ft level the principal work is confined to the enlargement and retimbering of the main air gallery southward. Boring upward with the diamond drill from this level to tap and draw off the body of water which presses upon the southeast slope of the 1400-ft level is being continued, and the drill hole is being enlarged. The 1400-ft level is yielding a large amount of excellent ore, and the breasts and stopes to the southward as well as upward are looking as well as could be wished. On the 1300-ft level also there are large reserves of good ore. A large amount of excellent ore comes from the 1200-ft level, and extensive deposits of it are being developed in the workings upward and eastward.

**CALIFORNIA.**—Daily yield, 630 tons, the most of which comes from the 1500 and 1000-ft levels. The main drift west from the C. & C. shaft, at the 1350-ft level (cross-cut No. 1) is 90 feet beyond the winze, and it has nearly passed through the porphyry horse into the west ore body. The north branch of this drift is in fair grade ore, and has 30 feet yet to run in order to reach and connect with winze No. 3, being sunk from the level above. On the 1000-ft level the drift is being advanced, and the fill floors south and west, are looking splendidly. The south drift from the bottom of winze No. 6 has completed connection with winze No. 5, giving good ventilation and better working facilities. The ore breasts and stopes on the 1550-ft level are looking and yielding finely. On the 1500-ft level the ore breasts are looking finely as usual. In all portions of this mine, the extensive operations are developing an apparently inexhaustible amount of ore, much more than can be handled and milled at present.

**YELLOW JACKET.**—On the 2200-ft level the main east drift is in 300 feet, paid in porphyry, with clay and quartz seams. The ground is dry and loose, requiring close and careful timbering. The drift has been turned more to the southward, so that its course is in the south. 60 feet has been gained directly for the new shaft. The distance from the face of the drift to where it will intersect the shaft, when it shall be sunk to that level, is 490 feet. The main drift south at this level is now in 313 feet. The face is principally in quartz of a somewhat soft, loose character. At the new working shaft the cage guides are all in, the dump completed and the sket in place ready for starting up.

**BELCHER.**—The south drift at the 1000-ft level is in 205 feet, paid in porphyry with streaks of quartz. This drift has been exceedingly hot, but since the connection was made between the air shaft and the Crown Point 2000-ft level it has been cooling off considerably. The prospecting operations at the south end of the 1000-ft level, including the running of a diamond drill 300 feet east, have amounted to nothing thus far. The air shaft, from its connection with the 2000-ft level of the Crown Point, has the effect to cool the matter of air circulation, which is a great advantage.

**JOE SCATES AND GEORGE DOUGLASS.**—The station at the 200-ft level has been thoroughly timbered, and a drift run 20 feet northward. The station will be used as a retreat for the miners during a blast, and for the storage of tools, etc. The water that had accumulated in the shaft below the station was lifted yesterday, and the work of sinking the main shaft resumed.

**NIAGARA.**—Work is resumed in this mine under the most favorable auspices. The shaft is down 530-ft, and at the lower level a very promising vein of quartz was already developed at the time work was suspended last winter, some streaks of which assayed as high as \$230 to the ton. The hoisting works are in excellent order.

**HALL & NORCROSS.** The pumps continue running steadily and well. The water rises and falls like regular tides. This peculiarity will be obviated when the Savage pump gets work and helps out.

**JULIA CON.**—The east drift from the winze at the 1800-ft level is being advanced at the rate of about four feet per day, face in porphyry of a considerably clayey nature. The main drift north at the same level continues all in

quartz, giving low assays, and is advancing at the rate of five feet per day.

**ALTA.**—Running three cross-cuts on the 1050-ft level, one being in nine feet of good ore. Expect to strike the ore body with another in two or three days, and with the third in eight or ten days.

**UTAH.**—North and south drifts on the 1150-ft level making satisfactory progress, with no particular change to note. The incline winze below this level is down below the 1350-ft level.

**CALEDONIA.**—Drifting north on the 1400 and 1500-ft levels progresses at the usual good rate. A strong flow of water from both levels is easily handled.

**SUTRO TUNNEL.** The face of the header continues in soft ledge porphyry, clay and streaks of quartz, which material works very disadvantageously and requires close and careful timbering. Advancement is necessarily slower at present than heretofore.

**OTHR.**—Work on the 1000-ft level is being advanced as usual in the south lateral drift, following the ore vein.

**SAYAGE.**—Good work is being done getting the pump rods and bolts in and the shaft properly straightened up, but considerable work in that line remains to be done before the pump can start working.

**ARRANGEMENTS.**—Arrangements are being made for cross-cutting at the 2000-ft level. The old upper levels continue to yield 10 or 12 tons of ore per day, giving average assays of from \$30 to \$40 per ton.

**MEXICAN.**—The north lateral drift on the 1000-ft level still continues in good-looking vein matter.

**UNION CON.**—Repairs on the 1300-ft level not yet completed. The Union and Mexican joint cross-cuts on the 1405-ft level are being pushed.

**EXCHICHER.**—The combination drift north at the 2000-ft level continues in soft ledge matter, requiring close and careful timbering.

**CHOLLAR POTOL.**—Daily yield, 75 tons; average assays, \$22.50 per ton. The main drift east toward the Combination shaft is driving ahead at the rate of six feet per day in hard blasting work.

**LEVITIAN.**—The new hoisting or gallow frame will be completed very shortly, when work in the mine will be resumed.

**SECOR.**—The very encouraging ore indications at the bottom of the shaft continue.

**WHEEL-FARRO.**—Work is resumed, getting the water out and starting to sink the shaft deeper.

## CHERRY CREEK DISTRICT.

**LIVELY.**—White Pine News, Sept. 29. From District Attorney Davis, just in from Cherry Creek, we learn that our neighboring camp is getting quite lively. The Star mine has started up the pumps, and in a few days the water will be all out and the work of extracting ore commenced. Parties are negotiating for the purchase of the Pacific and Mary Ann mines, and if they succeed another mill will be put in operation in a short time.

## HUMBOLDT DISTRICT.

**BYRON.**—Silver State, Sept. 29. We learn from A. L. Hurd that the Kunkel boys are steadily developing the Byron mine in Humboldt district. They are now sinking a shaft from the lower tunnel, and the ledge is represented as looking better than for some time past. The Byron is a gold bearing lead and has produced some of the richest specimens ever seen in this part of the country.

## HUNTER DISTRICT.

**PROSPECTS.**—White Pine News, Sept. 29. From Col. Coulter, who has just returned from a trip to Hunter, we learn that the prospects of that camp are very favorable. The new furnace, which is a new invention, will start up next Monday, and much interest is manifested by furnace men in the experiment. The Hunter company is a San Francisco incorporation. The town is growing in a healthy condition, having some 40 houses, many of them superior in construction and appearance to those of the average mining towns of the State.

## TUSCARORA DISTRICT.

**DE FREES.**—Cor. Old Hill News, Sept. 29. The De Frees has its main working shaft down 245 feet. The ore, though not very rich, is rapidly changing to the sulphuretted character, like that of the Grand Prize, which adjoins the De Frees. The same ledge, which is the main source of the Grand Prize comes from below the water line, and the De Frees company have every reason to expect the same very shortly. The ore now cutting into by the bottom of the shaft will mill over \$50 to the ton. A new level is now being opened from the 210-ft station under the most favorable auspices. The small four-stamp mill of the company is running steadily, and the water is being pumped out of the mine. The ore is being shipped from San Francisco. This mill will also be run by water power. When they get up their new mill, and get fairly at work with it crushing ore from the mine, it will be but a short time before dividends will commence coming from the De Frees.

The Grand Prize is getting along nicely, notwithstanding the little trouble occasioned by the burning of the building over their hoisting machinery, and they are now making considerable improvement in their surface works. The main building is being rebuilt considerably larger than the old one was, and in a very short time the Grand Prize will be yielding more and richer ore than ever. It is the chief of the Tuscaroras. Meanwhile both mills are kept steadily running on second-class ore, and the new furnaces is being urged to completion energetically.

The shaft of the Navajo is down 133 feet, and the drifts each way from it, following the ledge, are in the best of prospects. The new steam hoisting works are started up. In the venture they have a fine vein of choice milling ore, and are developing a valuable mine. The Grand Prize, Grand Central, Argents and other principal mines being developed are showing prospects of the most encouraging character.

## WHITE PINE DISTRICT.

**STAFFORD ORE.**—White Pine News, Sept. 29. We learn that the ore now being crushed by the Stafford company, at the Eberhardt mill, is yielding well—fully up to the expectation of its owners. Ore assaying 160 ounces up to 80 pounds per ton, which is far above the average mill, was taken from a King mining and smelting company have purchased the engine in the Treasure mill, and will use it in their new furnace. They have also purchased the frame house on Mill street, nearly opposite Mr. Karbstein's residence, and are having it torn down and hauled to the mine, where the lumber will be used in the erection of comfortable quarters for the workmen.

## Arizona.

**TURKEY CREEK.**—Arizona Enterprise, Sept. 22. Work, preparatory to the erection of the two-stamp mill in Turkey creek, has been steadily progressing. The mill site is located about 150 yards opposite the Kuro's station, and about half a mile from the Goodwin mine. The grade is continuously down from the mine to the mill, which will enable the owners to run cars if necessary. Kirwagans has the contract for doing the wood work in the mill, and James Mee, an old and reliable mill man, will superintend the erection of the machinery. The owners have taken the precaution to erect their structure in such a manner as to be able to increase it to a five-stamp mill, whenever circumstances will require it. With an engine of 25 horse power, they will merely have to add three stamps and a pan, to have a complete mill of a larger capacity. They expect to blow their whistle in about 40 days, and start on Goodwin ore.

At the Goodwin mine things are looking bright. Dave Neale is down 140 feet and in good ore. There are 100 tons of ore on the dump, ready for milling, that will assay \$100 without sorting.

**PURCHASED IT.**—Messrs. Hoffman and DeCrano, who have been here for some time past for the purpose of examining into the merits of the Tip Top mine, went to purchase the same, yesterday, and advised the owners that they would take the mine, the price for it being \$50,000. They also agreed to purchase the Cross-Cut for \$12,000 and

(Continued on page 220.)



### Placer County Gravel Channels.

In the last two issues of the Press we have published articles on the above subject, from correspondence of the Dutch Flat *Forum*, and continue the subject again in this issue, condensing the letter materially, however:

Having cleaned up the bed-rock of all mining news in the immediate neighborhood of Secret House, I will next take a tramp of six miles southeast to Canada Hill, the extreme limit of mining in our territory.

#### The Reid Claim.

During the two years that have elapsed since I was here, the owners have made great improvements. The old claim, now in over 1,700 feet, has been leased for some time to Chinamen, but as they were pretty conclusively caught at their old game of stealing, their contract was forfeited during my visit, and transferred on the same terms, \$40 out of every \$100, to Mr. Shipman, hitherto foreman of the Mao mine, at the Hogsback. The claim has paid well for some time back and promises to continue doing so. The reason for leaving the old claim, was to enable Mr. Reid to give his whole attention to the hydraulic rig he put up last season, which is both complete and effective in its arrangements. The head of Van Cleave canyon, the commencement of the claim, was very rich in early times; two brothers named Tushmen (one I believe is the present Sheriff of San Francisco), taking out 150 pounds of gold. The pipe was put on this old ground first, to make an opening that would command the center channel thoroughly, and, though shallow and with a short season, repaid more than half of the expense of fixing up, altogether about \$5,000. The gravel bank is now from 35 to 40 feet deep, pays from top to bottom, is free from refuse dirt, and washes easily. The water ditch is over two miles long, and will be run eventually to the head of the North Fork of the Middle Fork, when, with the reservoir already built, it will supply 500 inches a day for three months, about as long as piping can be continued this high in the mountains. The pipe is 600 feet long, with a pressure of 160 feet. This pipe commands the old diggings on the channel for over a mile, and will follow the drifting right along; but eventually, when the works are completed according to the present plan, two more pipes will be put down at other points on the claim. With an ordinary wet winter this year, the present pipe, it is estimated, will clear the expenses of the whole rig, including ditches and reservoir. If so, when the entire plan is completed, with free water, three pipes, good dirt, and admirable facilities for this process of mining, there will be but few superiors to this claim in the country.

#### Immediately below Mr. Reid comes the Buena Vista.

The property of a gentlemanly and hospitable company of Spaniards, who enjoy the entire confidence and respect of the community. So far this claim has proven very rich, over \$20,000 being taken out of a small piece of surface ground, ranging from two to 12 feet deep. The company are now running a new tunnel, at an expense of \$2,000, to tap the channel deeper, and otherwise increased their facilities for working.

#### A mile below Mr. Palmer's house, comes American Hill.

And with that I am through with the mines. This is an old location, very rich in early times, still being drifted, and in places yielding good pay. Its greater merit, however, lies in the vast extent of ground it contains piping, and its marvelous facilities for good working. It has a warm, southern, sunny site, that causes the snow to melt sooner than any where else in the neighborhood, thus giving a longer season for washing. The boulders are much decomposed, breaking easily with the sledge, and requiring no powder even for the largest. The pay gravel is 100 feet deep, and prospects all the way down from the surface. In early times, very heavy gold was found on the bed-rock; and to day, pieces weighing \$15, and \$8 are found, and were shown to me. It is estimated that the whole ground could be put under the pipe for about \$10,000, but allowing a large margin for freight and cost of iron for the pipe, the chief expense. I think that sum too large, and, we must add, as a set-off to that cost, that by purchasing the Palmer interest, the great desideratum of free water would be obtained to wash the whole property. I am sorry I must add another paragraph about the channel, but, without it, this letter would be incomplete. It is easy enough to see where the channel went to, but in our present state of information, it is difficult to say where it came from. Unquestionably it came from some where above the head of Big Secret canyon, intersected Manilla canyon, passed on to Palmers, thence down Brushy, through American hill, to the opposite divide near Last Chance. Standing on American hill this is all evident enough. But, I have other, and stronger reasons, for thus locating the course; and, the more these matters are intelligently discussed and understood, the more money, time, and labor is there saved in prospecting. It has hitherto been supposed, that this channel diverged from the head of Manilla canyon, and going into the mountains due northeast, formed the Canada Hill diggings. I never accepted this doctrine for a moment. Nature is very exacting in her decrees and requirements; in nature there must be, an ounce to weigh an ounce; there must be a why for every where-for all the time. Now, we may take it for granted, I believe, that the ocean, from all

time, occupied about the same position as it does at present; and, in consequence, the watershed of all pre-historic subsiding streams would have been the same southwest lead they have at present. To turn this particular stream therefore, off in the mountains to the northeast, would be contrary to the fundamental principles of natural law, and form an exception to the general rule that cannot be accepted. I think the Canada Hill ground deposit is simply a flat, or basin, that caught the first overthrow of the outbreak of the channel ending at the Nead claim, and not going, as supposed to the base of Bald mountain. Does not the character of the gravel and rock sustain this idea? Does not the part of the Nead claim paying less than the Buena Vista, and Reid above it, confirm the idea? But, on the west side of the Reid tunnel there is a new kind of gravel just opened, of a bluish white color quite different from that hitherto worked, and which exactly agrees with the gravel of Brushy canyon and American Hill, for I put a piece in my pocket and compared the two. I thought at the time, it would be useful in future examinations, and it proved so. These are the reasons, why I think the Reid tunnel will soon make a new development, compelling attention to a large piece of country at the head of Manilla canyon, which has heretofore, been overlooked, but which, in future, may prove very valuable.

### Australian Progress.

One cheerful and satisfactory feature in our iron trade statistics just at present is the substantial demand which prevails for British railway iron on Australian account. The Australians enjoy a happy immunity from the vexations and complications of European politics. They do not suffer, except, perhaps, in a very remote degree, from the dynastic ambition of Russia, or the effete despotism of the Ottoman Porte. Even the possession of the British Premiership by Lord Beaconsfield or Mr. Gladstone possesses only a comparatively languid interest for them, as they have long since practically outgrown the domination of the mother country, although they are still nominally dependent upon her. Then, the Australians are beginning, apart from all these considerations, to grow into communities of some intrinsic importance. Year by year, a certain stream of immigration sets in upon their shores; and the natural increase of population, through the excess of births over deaths, is by no means a matter to be overlooked. The wool trade of Australasia has attained such an importance that it may be said to have outgrown what Dr. Johnson would have termed even the "dreams of avarice." A quarter of century since we received somewhere about 50,000,000 lbs. of wool annually from the Australasian colonies. In the first seven months of this year the corresponding imports attained an aggregate of 249,586,782 lbs.; and it seems tolerably clear that for the whole of 1877 the imports will not be less than 300,000,000 lbs.

Under such happy circumstances and conditions as these it is not at all surprising that we should find the Australians very resolutely bent on the construction of the additional railways which they, not unnaturally, believe will very greatly increase their material prosperity. New South Wales, Victoria, Queensland, South Australia, and New Zealand, have all new railway-works on hand of more or less importance; and in Tasmania, and even in poor sluggish Western Australia, the iron horse is also getting steadily to work. It would not, so far as we are aware, serve any useful purpose to enter into minute details in illustration of these observations; but we may note the by no means unimportant fact that within the last few days the South Australian government has succeeded in placing another railway loan for £500,000, while the New Zealand government is credited with the intention of spending an additional £940,000 for railway extension purposes. The New Zealand government is naturally encouraged to adopt this bold and spirited policy by the fact that the net revenue of its railways, for the first half of this year, amounted to £80,000, while their estimated profits for the financial year ending June 30, 1878, are £170,000. All the railways—or nearly all the railways—of Australasia are in the hands of the various Australasian governments, and in every case they are beginning to yield respectable financial results, irrespective of the indirect benefits which they of course confer upon the various colonies. In New South Wales the return yielded by the government railways upon the capital devoted to their construction is, according to a recent official return, about £4 7s. 6d. per cent. per annum. In Victoria the return thus far yielded upon the capital devoted by the Colonial government to the work of railway construction is, we believe, not quite so much; but it is something similar, and as both New South Wales and Victoria can now negotiate four per cent. debentures at about par in the London market, any new railways which they may undertake are, practically, no burden to them. In South Australia, Queensland and New Zealand the solution of the railway problem is not quite such an easy matter. The revenue likely to be acquired is not quite so large, and the debentures of the three last named colonies are either not quite at par, or, to secure a ready sale, have to bear a slightly higher rate of interest. But still, even in South Australia, Queensland and New Zealand the current aspect of the railway question is decidedly encouraging, and, accordingly, we find that new lines are being projected energetically and liberally. One general

result of what is taking place at our antipodes in the matter of railway construction is that we are sending large quantities of railway iron to Australasia, and appear likely to continue to do so. In July our shipments in this direction amounted to 7,889 tons, while in the first seven months of this year they attained the goodly aggregate of 46,005 tons. Well may the British iron trade re-echo the antipodean watchword "Advance Australia."—*Colliery Guardian*.

### Minor Patents—Their Real Value.

The Commissioner of Patents, in his annual report for last year, makes the statement that fully two-thirds of the manufacturing interests of this country are based upon patents. The same report indicates that there are over 150,000 unexpired American patents. If we classify the people of this country into two grand divisions, those who are interested, either directly or indirectly, in patents, and those who are wholly independent of them, the number included in the former class will be found to be surprisingly large and not greatly inferior to that of the latter, even if not exceeding it. The fact is that, without estimating the influence which the condition of manufacturing industries exerts upon the general welfare, very many are unconsciously dependent, to a greater or less degree, upon the revenue or income derived from the development of trade protected by patents. The workingman, who does not always reflect upon cause and effect, but is contented with employment, is nevertheless as often indebted to an industry created and fostered by a patent as to the routine of labor which lies beyond the influence of any system of protection.

It is a matter of surprise to many how profits considerable enough to support and enrich so large a class can be derived from patents which seem to them to be of minor importance. They can perceive why the sewing machine, the telegraph, the revolver and patent devices of that kind yield princely incomes to the few who control them, but that there are yet fortunes in tin pans, meat cans, nails, sieves, and the numerous small and common articles which they are accustomed to see and handle daily, is beyond their comprehension.

While it is true that some minor inventions seem to exhaust all hope of further progress in the same direction, there remain many novel and important details of construction which practical and observing mechanics will discover and render serviceable. All prudent manufacturers are aware of the necessity of strict economy even in small matters, and of the expediency of gaining any legitimate advantage, however slight, in order to render a business profitable and permanent when opposed by energetic competition. The scraps from the shop must not only be hoarded, but they must not be sold until they are made into some useful forms; and the scraps from these also must not be swept away, but utilized until even the sweepings are barren of further treasures. Let some of those who may think lightly of such rigid economy compute the number of wagon-wheel tires, horse shoes and horse-shoe nails which may be restored from the dust of London pavements, or even from the streets of Chicago.

If strict economy is essential in these respects, it certainly ought to be also practiced in the first and intermediate steps in the process or art of making a manufactured product. If the making of a seam in a simple tin vessel can be avoided, an important step is gained at once. The article is then not only more durable, but more serviceable while it lasts, and an advantage is obtained which renders it more salable even at a greater price than before. A margin for competition is not only thus produced, but a considerable quantity of solder, rosin and horax is rendered unnecessary, and others are either carrying or using a greater stock of these materials than is needed. The figures opposite these familiar items in the expense account are smaller than formerly, and if the account of serviceable material sifted from the dust heap is not so great as before, it is because there is less there which is worth the saving; there is also less money passing the wrong way over the counter. We will not estimate the saving in soldering tools, heaters, charcoal and wages, nor in the diminished wear of machinery; in the saving in rents, fuel, gas and insurance, nor in the indirect advantage in the lessened chances of loss by fire and accident by reason of the ability to produce a given amount of finished goods in a shorter time than before. Accurate estimates in all these particulars might lead to a climax which would tax the credulity of many and cast suspicion upon the logic of our reasoning. Practical economists, however, will perceive more of truth than of sophistry in what we have thus far asserted.

If this wisdom, patience and skill is in time rewarded by a useful and practical discovery, what ought to be he done next? If you would rather be deemed generous than wise, surrender to a less intelligent, less prudent or less fortunate competitor. If he then underrates your kindness, carefully collect all the scraps and findings about your place and send them to him on your draw, with your compliments. He will probably receive all you give, and may, ere long, return you a specimen of your ingenuity marked "patented," and politely request you to allow him to monopolize the working of your invention. If he is moderate enough to appreciate your invention without patenting it, he may be contented to cut prices about the time you expected to increase them.

Fortunately our manufacturers, as a class, are neither sentimentally nor whimsically generous in matters of business. They do not stop to theorize, but study and embrace whatever is practical. They perceive the necessity of every fair advantage in business, and this is the true explanation of the reason why so many so-called minor patents form the basis of manufacturing industries. Many large establishments, heretofore flourishing and prosperous, but which have seriously felt the distress of the financial depression of recent years, have been kept from the verge of bankruptcy by reason of the protection afforded by patents which were formerly regarded as of minor importance, and many of these, instead of longer occupying subordinate positions, have become the chief source of reliance. If the strong boxes of many of our most successful manufacturers could be examined, there would be found therein numerous undeveloped patents quietly awaiting their season of usefulness, and also many which are humbly doing duty as tireless sentinels warding off encroachments and alarming even the remotest enemies.—*Western Manufacturer*.

### Deep Mining Shafts in Europe.

Twenty years ago the deepest mining shafts in the world reached only about 2,000 feet below the surface. The very deepest, we believe, was a metalliferous mine in Hanover, which has been carried down to a depth of 2,290 feet. The deepest perpendicular shaft to-day is the Adelbert shaft in a silver-lead mine in Prizibram, in Bohemia, which has reached a depth of 3,280 feet. The attainment of that depth was made the occasion of a three days festival, and still further noticed by striking off a large number of commemorative silver medals of the value of a florin each. There is no record of the beginning of work on this mine, although its written history goes back to 1527. Quite recently an elegant commemorative volume has been written and printed, which is most interesting to those who have a taste for either the actualities or antiquities of mining industry. There are two other localities, however, where a greater depth has been reached than at the Adelbert shaft, but not in a perpendicular line. These are: 1. The Rocksalt bore-hole, near Spersenberg, not far from Berlin, which, a few years ago, had been bored to a depth of 4,175 feet. 2. The coal mine of Viviers Remus, in Belgium, where the miners, by shaft-sinking, together with boring, have reached a total depth of 3,542 feet. Turning from these two mines, no shaft, in unbroken perpendicular line, has as yet exceeded the depth of 3,280 feet. Taking each singly, the deepest shafts in the world at the present moment, group themselves according to the following order:

1. The already mentioned Adelbert shaft, 3,280 feet deep. As the top of this shaft is 1,732 feet above the sea level, the bottom is, of course, 1,545 feet below it.
2. Two shafts near Gilly, in Belgium, are sunk to the depth of 2,847 feet. At this depth they were both connected by a horizontal drift, from there an exploring shaft is sunk to a further depth of 666 feet, and from there again a trial bore, 49 feet in depth, is put down, so that the total depth reached is 3,542 feet. As they did not, in the bore hole, discover the sought-for coal seam, they have returned to the shaft at the 2847-foot level.
3. The Eimgkerts shaft of the Lugauer coal mining company, Rhenania, Lugau, in the kingdom of Saxony, is 2,653 feet deep.
4. The Sampson shaft of the Oberhartz lead and silver mining works, near St. Andreasberg, Hanover, has a depth of 2,437 feet, and is at present the deepest shaft of Prussian mining.
5. The winding shaft of the Rosebridge colliery, near Wigan, Lancashire, England, has a depth of 2,458 feet. Coal is drawn from the "hanging on" at the 2,418-foot level; the time of the cage running this distance being 55 seconds; the winding rope has, therefore, an average speed of 44 feet per second.
6. A shaft at the coal mines of St. Luke, near St. Chaumont, in the Loire department, France, reaches 2,253 feet.
7. The shaft of the Dunkirk colliery, near Dunkinfield, Lancashire, is 2,069 feet deep, but the mining is prosecuted to a further depth of 755 feet by shafts from the lower levels, making a total depth of the mine of 2,824 feet.
8. The deepest shaft of the collieries, near Ronchamp, in France, is 1,881 feet. A similar depth has been reached by the argentiferous mine near Kongsberg, in Norway. The mines belonging to the Roros copper works, in Norway, have worked to the depth of from 2,540 to 3,270 feet.
9. The Amalia shaft in the mine works, near Schemnitz, in Hungary, is 1,782 feet.
10. The No. 1 Camphausen shaft, near Fishbach, in the department of the Saarbrück collieries, has now reached the depth of 1,650 feet, and may possibly become the deepest shaft in Prussian coal mining.

Although the depths to which the shafts enumerated have penetrated into the interior of the earth in the art and practice of mining may appear mighty, and may be an expressive witness of the great progress made in mining pursuits, yet, on the other hand, the above results may be considered insignificantly small when we compare them with the extent of the earth's crust and the diameter of the earth. The deepest bore-hole in the world is the artesian spring at Potsdam, in Missouri, which reaches a depth of 5,500 feet.—*London Mining Journal*.



## A Stage Driver's Opinion of the Black Hills.

The following letter is published in the *Eureka Sentinel*, written by an old stage driver now at Deadwood:

Times are kind of shading off out here just at present, and I think the chances are that it will be duller before long. The fact is, the country has been overrated. All those fellows that came rushing here in the spring, expecting to find mother California lying around loose, have got mighty badly fooled. Why, all the gold taken out since the first discovery wouldn't equal one old creek, such as we used to pan around in over in the Golden State, along in '50. The big rush here early in the season, has been followed by another just as big a one, but the last is going out instead of coming in, and the boys mostly prefer to walk; its cheaper and good healthy exercise, you see; and, besides, it don't make such a heavy draft on the pocket. I've been following the old business for the last three months, driving stage between Deadwood and Custer City, but I quit suddenly a week ago. It put me in mind of old times on the Geiger grade in Virginia City, along from '60 to '65. The road agents are just about as thick and twice as sassy. The robbing of the stages has got to be a regular business, and the boys have got it right down to a system. They know just as well when treasure is going out as the express agents. I've been stopped seven times since I've been on the route, and almost every time in one place, about 15 miles from the city, where the road runs through some underbrush, in a small canyon. My team got so used to it that they would pull up and stop just as regular as if it was at the station. The express company don't run any shotgun messengers, and the drivers ain't hired to fight, so the highwaymen have an easy trick. There ain't so much of the business going on as there was a month or two ago, but that is owing to the fact that treasure shipments are running rather light. I am thinking of going over to the San Juan country next week. This town will be too dead to kill in another month. There is a big talk about quartz, but I don't think the ledges are permanent. I have talked with lots of old Nevada miners, and they agree with me. Some of the claims were rich on top, but there are no indications of their holding out very long. It don't look like a mineral country to me, but I may be mistaken. There have been no new discoveries for some time. Some of the placer claims on Deadwood, Whitewood and Castle creeks are paying well.

Big Horn is a failure; at least, there has been no news of any big finds having been discovered yet. There was a big rush to that region a month ago, but very few people are starting now; and those who have come back bring discouraging reports from that section.

Most of the boys from Nevada are intending to go back to the Silver State this winter. It will be fearful rough here, and all kinds of mining will cease as soon as snow falls. Grub is pretty cheap, but it takes good rustling to get hold of the necessary coin to put up for it.

## Forest Fires.

There is a trite saying that wilful waste makes woful want. The truth of the axiom is shown in every-day life, and one does not have far to go to witness lamentable instances of extravagance and suffering as the two extremes of which the one is but the natural fruit of the other. Casual notice of the forest fires that have occurred in this State within three months, enumerates one in Los Angeles county, where 7,000 acres of timber were burned; another in the Santa Cruz mountains, which raged for two weeks and destroyed an immense amount of valuable timber; a third in the Coast range; a fourth now raging in the redwoods between this city and Santa Cruz; a fifth in San Mateo county, where the Spring Valley Water Company has suffered heavily, and where eight miles of forest and timber have been burned to the ground.

The question arises, how can these fires be prevented?—they can not be extinguished. What assurance have we that half the timber in the State may not at some time be swept away by a conflagration, and the forests which are the pride and boast of California be transformed into blackened and forbidding wastes? Assuredly some protection should be given the owners of these vast tracts of timber. They are now at the mercy of careless people, who set their forests a-fire and destroy their property with the utmost impunity. As the fires cannot be quenched when once started, the Legislature and the State authorities should take the matter in hand and create a law that shall declare private carelessness a public crime in this destruction of private property. Were a law enacted making the firing of forests a penal offense, punishable by fine and imprisonment, there would be fewer fires, and our timber would no longer be wantonly or carelessly destroyed by tramps, hunters, campers, etc. At the present rate of destruction, it will be but a few years before our mountain sides will be entirely destitute of timber, and building material will increase in price, owing to nothing save its useless destruction. If the members of the Assembly lately chosen from this county would co-operate with the members from Los Angeles, Santa Cruz and San Mateo counties, we doubt not that a law providing for the protection of our timber could be passed at the next session of the Legislature.—*San Jose Mercury*.

## Good Health.

## Lock Jaw.

EDITORS PRESS:—A severe attack of lock jaw is considered fatal. One of the leading physicians of Santa Clara, some years ago, said, "Jewett, neither you nor any other man can cure lock jaw." Not long after this, it was in the year 1871, there happened a case of lock jaw at Bakersfield of five days' endurance. The doctor in attendance had pronounced the case incurable. It was caused by a pistol ball shot through the foot. As soon as I heard of the case one of my sons accompanied me from Rio Buena rancho, sixteen miles above on Kern river, to a shanty on his farm below, where the afflicted lay with jaws closed, the upper front teeth set over by the lower ones. After liberty was granted to work upon him the writer said: "My friend, within 60 minutes you will be able to open your mouth, sir." He smiled, and it was truly verified.

The process was quite similar to the curing of sunstroke and apoplexy, as related in the *RURAL PRESS* of some months since. It was as follows: Three or more pails of water were heated to about 114° and poured from a coffee pot in a small stream, by Philo D. Jewett, on to the palm of my right hand, with the left pressing against his forehead. The water ran down from the finger ends, on to the spinal column, and base back bead of the patient, passing over each cheek on to the ground. This followed a hot water bath applied to feet and ankles, wiping dry with a coarse towel, then manipulating downwards, for a moment; soon binding a quantity of moist tobacco leaves over the wounded foot. While pouring the hot water, running from the hand, the tension gave way sufficient to pass his finger in and tongue out. The next time I saw him, one month after, he was in the village working at his trade as a painter. One time, in the village of Jackson, Michigan, I saw a notice that Ira Laudon, the forman track layer, was lying nearly dead with sunstroke. The writer soon visited this sufferer and applied the water treatment to his feet and back head, then manipulating downward, which cured or restored him in one treatment so that he went to work soon after. This man Laudon was subject to epileptic fits, periodically, which were fully checked, if not cured. I have been successful in curing epilepsy by the same process.

SOLOMON W. JEWETT.

Shepherd Home, Vt.

## Health and Flour.

A correspondent of the *Chicago Tribune* makes the following points: People are waking up to the fact that wheat is incomparably the royal grain, but that in our process of preparing it for food, it has been the most fearfully abused substance in the world. The term "Graham" is a misnomer, and ought to be no longer used—it means anything and everything—it is simply a cover under which is palmed off the poorest and vilest of all wheat preparations. The current "recipe" for "Graham" is third-rate flour mixed with bran. Any man who knows the vast difference there is in wheat food, knows how very far such a flour is from being the sweet and palatable food, sound, ripe and full-grown wheat is capable of yielding. Dealers who handle, and the thousands of persons who eat "Graham," know nothing whatever of the beautiful flavors of the pure, ripe, unadulterated grains.

Phosphorus, which is generally furnished to the system in wheat, is the great pabulum of the nerve tissues, and nerve force underlies and is the motive power of all the functions of the body. The system can no more digest without nerve power than an engine can run without steam, and the same can be said of every other function. This is wherein the whole wheat is most valuable, and wherein white or bolted flour is lamentably deficient. The latter does not supply nerve food—for 196 pounds of ripe, plump wheat contains over four times as much of this vital food as the same weight of white flour does—so that to get the necessary normal amount of mineral food there is in 196 pounds of wheat one has to eat over four barrels of white flour, and thus tax the system to digest over four times as much starch as nature ever intended. Is it any wonder, therefore, that digestion so commonly gives out, that dyspepsia and constipation, with all their attendant evils, are so constant and prevalent?

Several of your correspondents make mention of what they call "attrition flour." During a recent visit to Boston I found this flour much in use, and highly regarded. It should be called cold-ground (or disintegrated) whole wheat flour—although that hardly expresses it—for the astonishing part of it is that the bran portion of the wheat is reduced to an even fineness with the rest of the flour. This is a now, and indeed a great achievement; there is nothing like it in the whole history of flour as food. The cold grinding, or reduction without the use of

millstones, completely protects the food elements from any injury; and this even fineness of the bran portions of the wheat furnishes all that part in which the vital elements reside in a condition eminently promotive of digestion and assimilation, without irritation to the most delicate stomach; and furthermore, it adapts a whole-wheat flour trade, the purposes for which white or bolted flour has heretofore been exclusively used. Hence, not only bread, biscuit, gems, etc., but doughnuts, cakes of various kinds, pie-crust, crackers of all kinds, and the whole range of cooked foods of which flour is a component part, can be made of flour containing all the food elements of the wheat.

## Quackeries and Nostrums.

The following is from the *Pacific Rural Press*: As our readers know, we have returned an unyielding refusal to all those who would use our columns for advertising quacks and quacks' nostrums. We do this on principle. It is true that by such a course we lose many dollars which other publishers gather in, but we have the consciousness of a right course and of guarding our readers from many (and oft times serious) impositions; and this is better than gold.

Ever and anon there comes new evidence of the wisdom of our position on this matter. Analyses made of the most widely advertised compounds, show that they are either dangerous or worthless, or else a very little good is sold for 100 times its value, and thus the people are swindled. The latest testimony of the character of "medicines" which we see advertised all around us, comes from analyses made for the *Industrie Blatter*, of Berlin. From a translation of these, made for the *Scientific American*, we quote the following:

Dr. Pierce's golden medical discovery. A one dollar bottle holds 220 grains of a brownish colored clear liquid, consisting of 15 grains pure honey, one grain extract of poisonous or acrid lettuce (bot. *herba lactuce virose*), two grains laudanum, 100 grains dilute alcohol (64%), tasting like fusel oil and wood spirit, with 105 grains of water.

American toothache drops, made by Majewsky, in Warsaw, have different compositions. Those which took the prize at Vienna consisted of common salt and brandy, colored with harmless cochineal red (price, 37½ cts).

Ayer's pills consists of pepper, colocynth, gamboge (*guttif*), and aloes.

Ayer's hair vigor, a solution of 0.6% sugar of lead.

Horsford's baking powder. One powder contains acid phosphate of lime and magnesia mixed with a certain quantity of flour; the other is bicarbonate of soda.

Brandreth's pills, says Dr. Hayer, consist of gamboge (*gummi-resina guttae*), podophyllin, inspissated juice of physalocia, saffron adulterated with yellow root, pulverized cloves and oil of peppermint. The editor states in a foot note that, according to the assertion of two American druggists and one merchant, gamboge is present in Brandreth's pills, but that the action of the pills does not correspond to this constituent, in which latter assertion, we think, the editor is slightly mistaken, the pill being really cathartic.

Butter powders seem to be a favorite article of manufacture abroad, and are supposed to aid in making good butter quickly at any season of the year. They consist of bicarbonate of soda (baking powder), colored with turmeric or other less harmless pigment.

Hamburger tea contains 32 parts of senna leaves, 16 of manna, 8 of coriander, and 1 of tartaric acid, ground up together.

Dr. Sage's catarrh remedy, says Schadler, contains 0.5 grammes of carbolic acid, 0.5 grammes camphor, and 10 grammes common salt, which are to be dissolved in four-sevenths liter of water, and injected into the nostrils. It appears very probable that the wide reputation of this remedy is a deserved one, and the publication of its constituents will rather increase than retard its sale.

Schenk's mandrake pills. Hager says that these pills contain no mandrake. They do contain the constituents of cayenne pepper, a bitter extract, and some vegetable powder containing tannin.

R. R. R. consists of a reddish-yellow liquid, that smells of ammonia and camphor. It contains 14 parts soap, 40 parts of 10% ammonia, 640 parts alcoholic extract of cayenne or Spanish pepper, 4 parts camphor and 2 parts rosmarin oil.

Mrs. Winslow's soothing syrup consists, says Hager, of 8 parts of white simple syrup mixed with 1 part of a tincture made by extracting 10 parts of freshly crushed fennel seed and one part of oil of fennel, with 60% of spirits.

Sozodont for the teeth. The reddish liquid consists of a solution of 5 grammes oil soap in 6 grammes glycerine, 30 grammes spirits, 20 grammes of water, perfumed with a few drops of oil of peppermint, oil of cloves, oil of cinnamon, and oil of anise, and colored with cochineal. The powder is a mixture of carbonate of lime, magnesia and Florentine orris root. None of the ingredients can be considered objectionable.

## USEFUL INFORMATION.

## Petroleum Production.

*Stowell's Petroleum Reporter* has the following, which will interest all owning oil properties: From the present condition of things in the oil trade we have reason to apprehend that within the next six months more tankage capacity will be required than we now have available in the oil regions. Our views, in brief, for this are as follows: Although the statement of stocks of refined, at the six principal European ports, do not make a very large show, yet it must be borne in mind that the exportation into the interior consuming points of Europe, have been far greater this year than ever before, and we are well advised when we say that Europe is more largely stocked in distributed oil to-day than at any former period.

In consequence of this it is altogether reasonable to conclude that exports will materially diminish from this time until the opening of next year's business—and as the production in the region will undoubtedly be kept up to its present limit, and liable to be increased in the next 60 or 90 days—and as the home trade cannot be counted upon to consume the surplus thrown upon us by reason of the diminished exports, we may look for a considerable daily increase of our crude stocks.

This may throw upon us the misfortune of a deluge of oil, unless tankage is provided in time to take care of it. We regret to know that considerable of the tankage of the region, which was at one time available, is by reason of non-use, unavailable now; also that a large number of tanks have been destroyed by lightning within the last two years, while only a few have been built. We earnestly suggest prompt attention to this obvious matter. It will be observed that prices need not materially decline, notwithstanding the increased stock, for there is undoubtedly ready capital enough in the country to carry certificates, but no amount of capital will carry actual oil if the necessary tankage capacity is wanting.

OIL OF ROSES.—The world's supply of "attar of roses" is to be cut off. Can California enter the production? We read in the *British Trade Journal* that one result of the Russian General Gourko's adventurous rush through the Balkan chain is seen in the desolation of the lovely Tundja valley, and the almost complete extinction of a branch of agriculture peculiar to Roumelia. We refer to the culture of roses, carried on for the sake of the inestimable essential oil known as "attar." Kezanlik, which has not long been relieved from the odious presence of the marauding Cossacks—is the center of this remarkable industry, the annual value of which has been computed to be not less than \$80,000. But the Roumelian peasants have now to thank Russian aggression for depriving them, at least for some years to come, of this source of livelihood. The great rose field of Turkey, formerly the abode of peace and plenty, has been converted into a wilderness, and Europe must henceforth look elsewhere than to the Balkan slopes for its supplies of "attar." It has been suggested that India is quite able to supply the deficiency, but this is doubtful, and there is a significance in the fact that rose oil has made a great leap upwards within the last few weeks, the best being worth, at the present time, 40s. per oz., with every probability of a further advance. Dr. Septimus Piesse, an authority on all matters relating to perfumes, states the average yearly production of attar in the now devastated districts to be as follows: District of Kezanlik, 1,736 lbs.; Gucupsa, 754 lbs.; Karadja-Bahg, 384 lbs.; Tohirpan, 162 lbs.; Koyoun-Tepe, 118 lbs.; Pazardjik, 110 lbs.; Yeni-Saghra, 108 lbs.; Zaaghra, 98 lbs.—say a total of 3,470 lbs., or 55,520 ozs.

DESTROYING UNITED STATES TIMBER.—The Secretary of the Interior has addressed a letter to the Attorney-General with regard to the timber depredations. Speaking of the proposal of the United States Attorney for the District of Minnesota to purchase logs cut on the public lands, he says: "While it is my desire to dispose of the logs seized on terms as advantageous as possible, it is the principal object of the operations of this department to put an end to the timber depredations. It is above all things necessary that the depredators be effectually deprived of every possibility of deriving any benefit or profits from the wrongful acts they have committed. It is for this reason that I have directed that the stumpage system hitherto prevailing be discontinued. For the same reasons I withhold my approval from every compromise which would permit the logs seized to pass into the possession of the depredators with any chance of profit, and I insist upon the current market price of the logs at the places where they are held. I desire to make those who have hitherto carried on these depredations with profit understand that in attempting to steal timber from the public lands they will in any event lose the value of their labor and their expenses, and expose themselves to criminal prosecution. With regard to the criminal prosecution of depredators I would recommend that they be not confined to those mostly poor persons who actually cut timber on the public lands with their own hands, but that they be directed as well, and principally, against the parties who are found to have organized and directed the stealing of timber on a large scale, and derived from that criminal practice the greatest profit."





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Leather Belting, H. Royer, S. F.; Baird's Scientific Book Catalogues, Henry Carey Baird & Co., Philadelphia; Tarrant's Seltzer Aperient.

## The Week.

The week has passed without any startling developments in any of the mines having been announced. The bonanzas continue to pour out their treasures, and all the other Comstock mines continue their prospecting operations in hopes of striking rich bodies of ore. Mining men are greatly interested in what seems to be a weakening in the amount of water flowing into the flooded mines—a long wished for result of such continuous pumping operations. It is sincerely to be hoped that the flooded mines will shortly be freed again, so as to be worked in the lower levels, but most people had come to the conclusion that they must wait for the completion of the Sutro tunnel to see the mines drained again. It seems that Sutro, however, intends having a distinct understanding about the royalty question before he will let this water drain off, and insists that he will bulkhead the tunnel before he will carry off the water for nothing. If the water keeps on as bad as it has previously, Sutro will, no doubt, have the best of it, and stockholders will insist that some arrangement be made to let the water run off, instead of paying so much for pumping it out. In gravel mining, operations have been entirely discontinued nearly all over the State, from lack of water, and the miners are still getting their claims ready for work when the water comes. They are all hoping for a big water season this year, the last two seasons having been provokingly short. The shortness of the season, however, will be at least beneficial in one respect, for all the claims will be in first-rate order for vigorous and effective operations.

## Surveying in Mountainous Regions.

In regard to the systems of working generally employed in the different surveys west of the Missouri river, where such a large extent and variety of country has to be traversed and surveyed in a limited time, little is known by the general public. The survey is divided up into different parties, each one of which has special work to perform. There is generally a chief and assistant topographer, a geologist, two packers and a cook, with sometimes a botanist and a photographer. In the Hayden survey, where pretty accurate work is done, considering the area traversed, there are usually seven parties. Four are assigned to specific areas for the performance of topographical and geological work; one attends to the primary triangulation (under Mr. A. D. Wilson); one attends to collecting photographic views of the most important scenery; and one transports supplies to the various districts. A system of triangles is generally extended over the whole area, while at the same time topographical sketches and angles are taken, barometrical readings made at all occupied places, camps, places of note, passes, etc. The geological work is done at the same time, and notes taken in all matters connected with the survey, such as agricultural and mineral resources, etc. These notes, etc., are then worked up in the office at Washington during the winter by the different individuals, and their reports are incorporated into that of the United States Geologist, which is then published.

In 1875 the work of the Hayden survey was generally done by means of the plane-table, and re-inforced by means of both vertical and drainage sketches from all the stations, and also by time-meanders of all the main streams, and generally by a running sketch of the routes traveled. In Colorado, in that year, by meandering, Mr. Chittenden surveyed the San Juan river, the La Plata, the Mancos and the Dolores creeks, all of them considerable streams, and besides these, the McElmo and Montezuma creeks. In the meander he made a trigonometric location as often as once in ten miles.

Professor Hayden, in his letter to the Secretary, in the report of 1875, dated, however, March, 1877, expresses the opinion that the plane-table system, generally used that summer, is admirably adapted to a low, broken country, where good "points" are abundant, and works also extremely well in a simple canyon country, where there are surrounding prominent points at not too great a distance. But in a mountainous country it could not be used to any great advantage, and was eventually abandoned in all mountain work. In a low, broken and canyon country it is probably the best system that can be used; but in the ordinary rolling and mountainous country of the Northwest it will not repay the extra weight and time which its use entails.

In any but a very mountainous country, a system of meander, Prof. Hayden thinks, seems to be almost necessary to make work on a scale of four inches to the mile complete. It is the abuse and not the use of the old odometer system that has brought it into so much discredit. If properly checked, the meanders give to the more important portions of the country, as the traveled routes and principal rivers, the greater degree of accuracy which is their due.

The third and only remaining system in use in the West is that generally employed in this survey, and formerly used in the California State geological survey, and in that of the fortieth parallel. It consists of a system of vertical and horizontal sketches based on a rather elaborate triangulation, and checked by numerous angles, both vertical and horizontal. This system is peculiarly adapted to a rolling or mountainous country, and in such a country cannot be equalled by either of the other modes. It works well, too, in a country of different character, and is, probably, on the whole, Prof. Hayden says, the best system on which to base work in the average country of the West. It should, however, be supplemented by good meanders of all the main roads and rivers. In the work of the Hayden survey, last summer, all these systems were employed, and the above remarks are the immediate result of the observations.

THE STATE DEBT.—According to the Controller's report the total funded debt of the State, on June 30th, 1877, was: Civil bonds of 1873, \$2,801,000; State Capitol bonds of 1870, \$250,000; State Capitol bonds of 1872, \$250,000; soldiers' relief bonds, \$95,500; civil bonds of 1860, \$1,500; civil bonds of 1857, \$13,000; making a total of \$3,411,000. As all the bonds of the issue of 1857 and 1860 have been called in, and the interest ceased on the 31st of July, 1877, the funded debt bearing interest at this date will only amount to \$3,396,500; bonds held in private hands, \$731,500; bonds held in trust by the State Treasurer for the school fund, \$1,737,500; bonds held in trust by the State Treasurer for the University fund, \$811,500; bonds held in trust by Regents of the State University, \$116,000.

SUCCESSFUL tests have been made in this city with the telephone, over the Merchants' Exchange line from the Exchange rooms to the Point Lobos station, a distance of seven miles. Singing and talking were carried on, and in each instance the words were distinctly heard and the speaker's voice readily recognized.

## A Powder to Make Gold.

Our old correspondent, Mr. Henry Sewell, who has recently returned from Chile, gives us some items concerning the doings of Paraff, of oleomargarine fame, who is exercising his ingenuity in getting up some wonderful schemes for the Chileans to make money fast. Paraff will be recollected by many here as the man who was going to make first-class butter out of old fat, lard or any other kind of grease. He succeeded in getting considerable money out of the operation, but the butter did not "go down." He then turned his attention to metallurgical operations, and had some wonderful processes for getting something out of nothing. He finally left San Francisco, however, for more congenial climes, where his doings would not be inquired into so closely.

He is now in Chile, and, according to Mr. Sewell's account, is flourishing in a manner no doubt satisfactory to himself, whatever the result may be to the Chileans in the end. When he first went to Santiago he started up the oleomargarine business again, but some Frenchman there stopped the business, as he owned a patent for the process himself. Then Paraff's genius showed itself in another direction. Chile, it is well known, produces 60% of all the copper consumed in the world. There are large masses of copper sulphurets, assaying from \$10 to \$15 per ton in gold, but which are practically useless, as it costs more to get out the gold than the gold is worth.

Paraff announced that he was able and prepared to extract this gold at a profit, and, moreover, could get more out of the sulphurets than they assayed. He stated that he had an ingredient which, mixed with the ore in a certain way, would bring out not only the \$15 per ton proved to be present by both humid and fire assay, but also from half a pound to a pound of gold beside to every hundred pounds of copper sulphurets. This proportion rather took the Chileans, who, if the statement were verified, had more riches at their doors than they ever dreamed of. Paraff proceeded to prove it. He gave some of them a portion of his peculiar powder, and told them to assay it. Result: no gold, no silver. But this powder could precipitate out of the mass of copper sulphurets the quantity of gold he stated. The powder is taken publicly and mixed with a lot of the sulphurets, and the whole reduced in a crucible. Result, 35 pounds of gold—pure, virgin gold, which, assayed at the mint, was found to be perfectly pure.

Paraff, therefore, has at last found the philosopher's stone. The success created a profound sensation. Mining engineers, chemists and those high in authority are converted to his belief. Now, large and expensive works are being erected in Santiago to work the copper sulphurets by this process. Paraff has sold to the Chileans alone stock in the company to the amount of \$200,000. He has, moreover, purchased for himself at the price of \$150,000 a villa residence formerly belonging to Harry Meigs, near Santiago, where he has large gardens and a palatial home. The place cost originally over \$200,000.

All this has been accomplished in a very shrewd manner. In the first place the copper sulphurets contained some gold, as they all knew. They were first-rate things to operate on. He alone had the secret of this wonderful powder, and he alone must manage the undertaking. By working in a small way he turns out 35 pounds of gold, and other lots in smaller quantities. No large operations could be carried on without extensive works. These could not be built without selling stock, and Paraff sells the stock. Some of this has been offered even in New York, Colorado and elsewhere, but we hardly think much of it has been bought up in this country. The ingredients for making gold, discovered by Paraff, is no new thing. Scarcely a generation passes that half a dozen people do not discover it. The only thing is that the gold it makes is seldom seen. Paraff is ahead on this, as his gold has not only been seen, but refined at the mint.

Mr. Sewell informs us that he denounced the whole scheme in the papers, but such is the hold Paraff has on the people, that, although Sewell is a mining engineer of experience, a native of the country, and related to several high officials in the government, his words fell on barren ground, and his advice has not been heeded, so that Paraff comes off victorious. Paraff is also forming several other companies and selling stock or patent rights. Among them is a plan for watering the streets with chloride of calcium, such as is done elsewhere. It will hardly need a shrewd observer to conclude that when all the stock is sold in the companies, Paraff's ingredient for making gold will be found to be his wits, and he will not even want to water the stock with or without chloride of calcium.

The reason why he has been so successful, is that those persons calling themselves mining engineers who are there, seem to have as much faith in Paraff as others. One of them has written to a relative here telling him not to denounce Paraff here, as he is really doing wonderful things. This from a mining engineer educated in Germany. Paraff was shrewd in other ways, also. In order to raise the value

of the stock, after experimenting on a small scale, he shipped 12 boxes of the regulus to Liverpool on the Pacific Steam Navigation steamer *Valparaiso*, on the 28th of March, 1877. The shipper was a person of the first position in Valparaiso, Mr. A. Edwards, who is worth upwards of twenty millions, made in the Chilean silver mines. Paraff requested this firm to place this valuable (?) cargo along with the silver bullion in the iron safe of the vessel, and paid a high freight therefor. Mr. Sewell went to Liverpool on the same steamer, and asserted at the time that the regulus could never be sold, as it really only contained a few ounces to the ton. Persons on board ridiculed the statement. On the strength of this shipment Mr. Paraff sold stock sufficient to supply gold to fix up the regulus on a larger scale. The regulus never was sold, but was shipped back to Chile on a sailing vessel.

## Notices of Recent Patents.

Among the patents recently obtained through Dewey & Co.'s SCIENTIFIC PRESS American and Foreign Patent Agency, the following are worthy of mention:

BATH HOUSE.—Francis Despoix and Joseph Reboul, S. F. The improvements designed by these inventors are in connection with such vessels or floating structures as are provided with bathing or swimming tanks. This floating structure is divided into two main compartments, one at each end of the vessel, leaving a promenade entirely around each. The roof is made of glass. In each compartment is a bathing tank with an adjustable bottom. The bottom is supported by hangers or other suitable means, so that it can be inclined to give shallow water at one end and deep water at the other end, or it can be lowered to give a uniform depth. The walls of the hull, and also the bottom, are made double, and the space between the walls is filled with saw-dust, or other non-conducting material, to prevent the temperature of the outside water from affecting the temperature of the water in the swimming tank. The dressing rooms are arranged around the tank in the usual way. The boiler is set between the two compartments. A steam pump supplies water for the tanks, the water being passed through a heater before introducing it into the tanks so as to raise the temperature to the desired degree. The water pipes which conduct the water from the heater to the tank, pass around the tank inside the wall of the hull, and numerous branch tubes connect this pipe with the tank at different points, so as to distribute it equally. At both ends of each tank are openings through the side of the hull, and these openings are closed by valves, to shut out the water when necessary. By opening these valves the outside water is allowed to pass into each tank at one end and out at the other, thus cleaning them thoroughly and easily.

BELT.—Herman Royer, S. F. Mr. Royer, who has a large factory for the manufacture of belting, etc., has perfected a number of valuable inventions in this line. His latest one is a combination of bark or chemically-tanned leather and fullered rawhide, the latter prepared by a process also invented by Mr. Royer. The characteristic quality of bark-tanned leather is its hardness and ability to resist compression, while the fullered rawhide is noted for its elasticity and tensile strength. It will be manifest that when belts run over pulleys (and especially if the pulleys are of small diameter and the belts run slack), the tendency is to compress the inner side of the belt, while the outer side will be correspondingly stretched. This compression and elongation will not be perfectly effected by the use of ordinary leather, and, if fullered rawhide is used, the repeated compression and relaxation of the interior surface, as it passes around the pulley and again becomes straightened, has a tendency to cut it after continued use. In this invention, therefore, Mr. Royer makes the inner part of the belt, which comes in contact with the pulley, of ordinary tanned leather, and the outer part is made of fullered rawhide or mechanically prepared leather. These two parts are cemented, riveted or otherwise secured together in any suitable manner, so as to form a solid belt; or the belt may be made of a single piece, one side of which has been chemically tanned, while the other side is fullered or prepared in a mechanical manner, thus attaining the object of hardness upon one side and elasticity upon the other in one piece. This style of belting has met with great favor wherever introduced.

BED.—Bartholomew Essig, Sacramento, Cal.

This invention relates to a novel construction for bed bottoms, comprising the springs and their adjustment to regulate their elasticity, and also their combination with the frame of the bedstead, so as to serve as fastenings as well as springs. The invention also relates to a novel method of elevating and depressing the head of the bed for invalids, or for other purposes.

BALL AND SOCKET COUPLING.—Wm. Lane, S. F.

The coupling device is for connecting two objects, such as, for instance, two railway cars, connecting pieces of chains, attaching a wagon pole to a wagon, etc. The device is simple and convenient, but a detailed description would be unintelligible without the aid of engravings.



## A Mechanical Dictionary.\*

We take great pleasure in announcing to our readers the completion of Knight's American Mechanical Dictionary, which has just been published by the well-known *Riverside Press*; its advent should be hailed with satisfaction by every practical man in the land, for it relieves a want that has long been felt among all classes engaged in industrial pursuits.

This work is the result of twenty-five years application, much of the time having been passed by the author in the United States Patent Office, where he was engaged in editing the Patent Office Report and classifying patents, and subsequently editing the *Official Gazette*, and systematizing for examination the 20,000 applications for patents which yearly are presented to that office. Sitting at the very center and focus of the mechanical thought of the country, he saw the necessity for a compendious description of the tools, machinery, processes and appliances of the arts and sciences—in short, a *Dictionary of Mechanical Terms*.

The value of a work of reference depends largely upon its index. When one has a question to ask of an ordinary encyclopedia it is frequently very difficult to determine under which title or heading to look. The MINING AND SCIENTIFIC PRESS Patent Agency have found this work extremely convenient and of great practical value, and take pleasure in recommending it to others.

The author has invented a system of what he terms "Specific Indexes" by the use of which the inquirer is guided direct to the information he is in quest of, even though he be entirely ignorant of the name of a thing, and have but the most vague and general notion of its use. This is accomplished by grouping under the general title of each science, art, trade, or profession, a list or "specific index" of every article in the book bearing any relation to the subject in question. The titles of these indexes are in turn grouped on page v. vol. 1, so that by a glance one may determine which index to follow.

Beside the use above mentioned, the "specific indexes" afford the reader an excellent opportunity for investigating thoroughly all that pertains directly or indirectly to any special subject, by using the index under the title of that subject, as a sort of head-center, and following out its various branches through all their ramifications.

Fifteen thousand words are thus assembled in what may be called these professional and trade vocabularies.

Another unique and valuable feature of the work is a *History of Inventions*. In these days of "modern improvements" one is very apt to placidly accept the result of long ages of patient ingenuity, without stopping to inquire into the history of the thousand and one appliances for comfort by which we are surrounded. Yet nothing can be more instructive or entertaining than to follow the gradual development of mechanical ideas, from crude forms of early times to the perfect fruition of to-day.

The author has given, in connection with a description of each machine, tool, instrument or mechanical appliance, a more or less circumstantial account of its history. A sort of mechanical biography in which the varying fortunes of each article is narrated in chronological sequence.

The work also contains another extremely valuable and entirely original feature, which the author has been pleased to term a *Technological Vocabulary*. Rather a formidable looking title, but simple enough in its significance.

There are many terms in use among various

trades and professions which are not to be found in any lexicon, because they are not "King's English." By constant use they have become semi-legitimate, and once in awhile a few of them have established their claim to respectability and been admitted to the citizenship of "Webster's Dictionary." But thousands of others, less fortunate, have no abiding place, and, though indispensable, have not yet been recognized in any etymological society. Here, then, is a rallying place for these words of "doubtful fame," and under the title of the thing to which each term pertains, we find them comfortably provided for.

Thus under "Mold," may be found a list of 127 "Molders' Terms," which are current amongst foundry workmen. Miners have their peculiar terms and phrases which are defined under the head of "Mining Appliances," etc.

The value of this vocabulary must be apparent. It is a sort of supplement to "Webster's Dictionary." Various technical operations are incapable of being explained without the use of these words, and the only wonder is that a special "Technical Dictionary" has never been published before.

The idea of classifying them so that all terms pertaining to any special trade or profession may be found appended to the article treating upon the same, is truly admirable. By this means one may thoroughly inform himself concerning any particular business, and venture among the knowing ones with unfeigned composure.

Philologists may gather here abundant material for investigation, and pause to marvel at

## Items of Interest from the Mines.

We give below items of interest from prominent mines, most of which are collated from letters of the respective Superintendents on file at the offices in this city:

The machinery and lumber for the new mill of the De Frees mine is now being forwarded to Tuscarora.

The south drift 950-foot level of the El Dorado South is now all in very rich ore.

As soon as the station in joint cross-cut from 2135-foot level of the Alpha is finished, sinking the incline will be commenced.

They are getting a good stock of coal and ore on hand at the Modoc Con. mines, so a prosperous run is expected when the furnaces start up.

The ore being extracted from the Coso Con. mines is equal to any heretofore raised, and the stopes are looking well.

The Crown Point 2000-foot level south drift connection with the Belcher and Crown Point shaft affords a good circulation of air through the level. Cross-cutting this level will soon be commenced.

They are about resuming the work of sinking the shaft of the Wells-Fargo mine.

The 1400-foot level of the Overman has cooled off very much since the Belcher and Crown Point connection was made.

Chollar last week turned out 539 tons of ore, assaying \$22.50 per ton.

From September 19th to the 27th, inclusive, the Manhattan mill reduced 159 tons, the assay

## Dedication of the New Board Room.

In another column we give a description of the new building of the San Francisco Stock and Exchange Board, which was formally opened on Monday. A very large crowd was present at the first session in the new quarters. At 11 A. M. John W. Coleman, President of the Exchange, A. H. Lissak, Jr., Vice-President, and B. H. Coit, Chairman of the Board, ascended the rostrum, when Mr. Coleman delivered the following address:

*Members of the San Francisco Stock and Exchange Board—GENTLEMEN:* In taking possession for the first time of this building we are compelled by a mutual association of ideas to reflect at once upon the past, the present and the future, for I am sure that there is no one of us to whom this evidence is not emblematic of something more than the adornment it works to our beautiful city and comfort it affords to us. It stands not only as an exponent and outward and visible sign of the success, the magnitude, and flourishing condition of a great industrial pursuit, evidencing by its proportions, its finish and its solidity the completeness and perfection to which have already been brought all the appliances and methods for the workings of that pursuit, but it calls up at once the thought of the causes which have produced it and the future which it is to illustrate.

It reminds us not only of the projectors and workmen who fashioned it as it were but yesterday, but takes us back to the time not very far remote, when the tidings of the discovery of the precious metals in this then far-off land, summoned as by a tocsin the hold, the enterprising, and the ambitious from all quarters of the globe; and causes us, in thought, to accompany on their perilous journey the brave pioneers who, in obedience to that summons, left home and friends and old associations to tempt the fickle goddess of fortune in the new El Dorado. We follow them on the dreary march, over the waste of waters. We feel their homesickness and participate in their bright visions of success. We note how the pan and



CHAIN BRIDGE OVER THE RIVER DNEPER, AT KIEFF, RUSSIA

this prolific source of word making.

The work treats of 20,000 subjects, and is illustrated with 7,500 carefully prepared engravings. It would indeed be correct to say that the illustrations are fully 15,000 in number, inasmuch as a variety of distinct forms of a machine or tool (sometimes as many as forty), are frequently associated in a single cut. Had the object been to spread them out and make a show, these cuts might have been enumerated as separate figures.

The accompanying engraving is a sample of the full page engravings in "Knight's Mechanical Dictionary." It represents a chain bridge over the River Dnieper at Kieff, Russia. The structure is a very massive one, as the engraving shows, and is a type of this class of bridge. The river in its course passes through the most fertile provinces of Russia and through different climates. The most remarkable bridges are at Smolensk and Kieff. That at the latter place being the one shown in the engraving.

The book also contains seventy-five full-page plates of rare style and beauty. For general typographical excellence, and quality of paper and binding, the work is unsurpassed. It may be had by subscription only, in three bound volumes, containing in all 2,831 pages, at from \$24 to \$30 per set, according to style of binding. Address A. Roman & Co., No. 11 Montgomery street, San Francisco, general agents for the Pacific coast.

The Lyon County Times states that Supt. G. D. Holt will commence operations at once on the Niagara mine. This mine has laid idle for some months, owing to difficulty in the managing powers at San Francisco. Work is resumed under favorable circumstances.

value of which was \$36,118.37. Of this amount \$8,990.07 was from custom ore; \$1,934.82 from tribute mines, and the balance from the Frost and Curtis mines (\$25,193.48). At the Frost shaft the east and west stopes above the 570-foot level continue in good ore, with a large ledge. The 570 east drift has been discontinued for the present, having passed beyond the limit of the chimney.

The furnaces for the Grand Prize are about completed, and will start as soon as the shafting arrives.

A. C. Hamilton, Superintendent of the Imperial, has been appointed Superintendent of the Alpha Con., which adjoins the Imperial on the north.

The necessary machinery and equipments having been purchased for the Aztec mine, of Aztec district, Arizona, work will be vigorously prosecuted at once. The rich ore on the dump will be milled and shipped to this city.

Fourteen mining incorporations paid dividends this month.

An additional force of 35 or 40 men will be put to work in the Sutro tunnel. The majority will be employed in repairing and retimbering the tunnel.

Colonel Shafter has crossed the Rio Grande with 600 men and two Gatling guns to extricate Lieut. Bullis from his position. No collision is reported from the Rio Grande, but it is thought that Bullis and Shafter have fought with the Indians on Mexican soil. Shafter has been reinforced, and eight companies are now in Mexico. Gen. Folsom, commanding the Mexicans at Piedras Negras, has ordered his officers to keep on the trail of the Americans until they recross the river.

rocker and other rude and primitive appliances suggested and then gave way to the perfected methods and improved machinery, by the use and application of which the mighty results have been achieved, which necessitated our existence, and now support our organization. And in the ease and comfort of these new apartments, it is most fitting that we, to-day, acknowledge our obligations to the pioneers, and pay our tribute to their daring, their hardy virtues, and their grand achievements, and resolve that we all endeavor to meet the difficulties and surmount the obstacles we have to encounter with the same resolute purpose, the same energy and dignity which inspired them. But, perhaps, of more immediate and practical import than this recognition of such an occasion of the claims of our forerunners and founders, is the obvious lesson suggested by this retrospect for our guidance in the future. By considering what has been accomplished in the past with crude and insufficient means, we may the better attain to a realization of what may be accomplished in the future, aided by past experience and equipped with all the tremendous weapons of modern industrial warfare.

Then with affectionate remembrance and recognition of the past and the true and the brave who have departed with it, with due appreciation of the present and with bright and buoyant and brilliant hopes of the great future before us, let me welcome you to this noble structure within whose walls we are, I am confident, well and unanfully to play our part and to contribute our full share to the swelling glory of the young city we all love so well, and whose rising grandeur we have watched for years with such jealous pride.

The Creedmoor rifle team has returned,

\* Knight's American Mechanical Dictionary: A Description of Tools, Instruments, Machines, Processes and Engineering; History of Inventions; General Technological Vocabulary and Digest of Mechanical Appliances in Science and the Arts. By Edward H. Knight, Civil and Mechanical Engineer, etc. Illustrated with 7,500 engravings. New York: Hurd & Houghton. Cambridge: The Riverside Press.



### Metal Growth.

The following paper "On Native Copper, Silver and Gold in Abnormal Conditions," was recently read before the British Association by T. A. Readwin, and published in the London *Mining Journal*:

Attention has already been directed by me to some interesting recent changes from normal conditions of certain minerals, containing severally copper, silver and gold, and I would now specially refer to 15 specimens worthy of particular notice. All the metallic changes upon them have taken place at what may be called ordinary temperatures under ordinary conditions, and the observed changes have been distinguished by me (wanting a better term) as "Metal Growth." Perhaps, it is hardly safe to say that a mineral under observation at any time is in a normal condition, for most analyses disclose the presence of substances thought to be foreign to the chemical composition of the respective minerals analyzed. In short, it is not clear that we actually know the original, normal or ordinary conditions of any mineral whatsoever.

We are accustomed to say that every solid inorganic body is either amorphous or crystalline, but on examination it will be seen that none of the metal growths present are either crystalline or amorphous. They are really multimorphic, although several of them (like many others in my possession) have a general resemblance. It is observable that some of these palpably recent exudations have occurred before and others after the decomposition of a sulphide. Others, as far as surface appearances reveal, exuded wholly independently of sulphides, etc. A natural continuity of transference of mineral substances into vegetable matter in the production of new growths, forms and shapes, is a fact universally admitted; and I submit that it has yet to be shown whether there is not also a similar varied continuity in mineral metamorphoses, inasmuch as there are evident nearness of relationship betwixt abnormal aërocentric, plumose and other metallic shapes, and some of the lower vegetable appearances.

It has been suggested as possible that one of the results of the visible decomposition of a compound may be the generation of a kind of "formation force" in one of the substances contained in it, somewhat analogous to "vital force." Some such force may really be, but assuming it to be, it will only partially explain the phenomena now exhibited. There will remain unexplained the distinctive metal growth from undecomposed or normal sulphides, and more extraordinarily still, those growths from what appears to be pure silica in a normal condition, unassociated, as far as is known, with any other metallic substance. By process of negation the cause or causes of these mineral alterations may be pushed somewhat into a corner for determination. For example, under the known circumstances of these changes the action of water cannot be said to have had any influence; of gaseous influence none can be imagined. There is a total absence of the usual observed effects of heat. Atmospheric influence is barely possible. Light, potential in plant movements, somehow may be a possible aid in mineral movements or growths. A latent electro-motive power is also possible. No acid appears to have been concerned, except that of silicic acid, in the solid condition of quartz, in some of the specimens.

This leads to the idea that sometimes such growths derive their accumulating or aggregating particles from metal contained in the quartz matrix in a fluid state of infinite rarity, and as yet imperfectly understood, if not altogether unknown. The last idea in possible connection with electro-motive power of some kind may ultimately be found amongst the causes of such abnormal mineral conditions as these about to be described.

Commencing with one of the abnormal conditions of copper, I may mention that one specimen, a cherty-quartz fragment, commenced sending forth its copper exudations less than three years ago. Since February, 1876, I have noticed a growth of one-tenth of an inch, within the period of three weeks. The movement at the apex of the looped growth has sensibly increased since April 17th last.

Silver growth is shown in two specimens; these are recent silver growths from Mexican silver sulphide (argentite). The very numerous prolongations seen in the first of these are all of recent date, the brightest being of most infantine growth. All the silver debris has curled off since Christmas, and most of it has resulted since May 6th last. There have been fewer alterations of the second specimen in the same period. A third specimen exhibits interesting silver growth out of argentite in calcite. A fourth specimen affords a very interesting illustration of silver growth out of argentite in calcite. Nearly the whole of the silver sulphide is enclosed in a film, the materials of which will not effervesce in acid. And a fifth specimen is an extremely interesting example of silver growth out of what appears to be normal calcite unassociated with silver sulphide. The last three specimens were obtained by me on June 6th last at Kongsberg, in Norway, and had very recently been taken out of the ancient silver mine in the neighborhood. Since that date I have detected a few new splinter-like silver movements in the third of these specimens, and only one now little silver movement in the fifth; but in the fourth two small silver exudations have appeared from the film-covered

argentite, and numerous delicate and purely argentite growths in the cavities. The first and second of this series of specimens are Freiberg silver sulphide (Acanthite). The horse nail-like coil movement in the first specimen has taken place whilst in my possession, and the two similar exudations in the second specimen within the last three months.

With regard to gold growth, I will first refer to two specimens which show interesting recent argentiferous gold growths (or, more definitely, electrum growths) out of iron sulphide (pyrites) in a normal condition, associated with quartz. [Metal = 50 Au. 20 Ag.] Two other specimens show recent electrum growths out of decomposed pyrites, associated with quartz. A fifth specimen shows recent electrum growth in quartz (apparently) unassociated with any other metallic mineral. A sixth specimen shows extremely interesting recent electrum growths in an indexed quartz cavity, resulting chiefly since May 6th last. And a seventh specimen shows, perhaps, the most interesting illustration of recent electrum growths. One filament is one-tenth inch longer than it was on May 6th last. I may mention that I have also electrum growths out of galena, blende, mispickel, marcasite, tetrahedrite, tetradymite and harytes. In the present mineral associations, calcite appears to have a "superior affinity" for silver, and quartz for gold.

I select these illustrations from a considerable number of what are commonly called abnormal conditions of native metals, most of which, I think, may be not inaptly called metal growths. In conclusion, I beg to say that I do not think such facts as these are at all of uncommon occurrence, although they may have been for the most part unobserved, owing, it may be, to the popular idea that mineral substances took their present shape and forms in time periods very long anterior to the birth of living mineralogists. I have therefore, brought the facts forward in the hope that in the future more attention may be given to mineral changes in their relation to time.

### NATURAL PRODUCTS OF PLACER COUNTY.—

We have received some samples of clay, sand and coal from the Spinks mine near Lincoln. One who has seen it says the clay is known to be as good as there is in the world, and a Mr. Newman, of San Francisco, pronounces the sand very fine, it being the same as is used in the manufacture of pure white glass. The samples of coal we have seen quite firm, and far superior to that taken from the old coal mine at that place. The coal ledge is eight feet thick, and the quality retains its superiority as far as the drift is in, at present over 30 feet. There is a fine clay pipe factory at Lincoln, and a pottery could be erected on the site of this new mine that would possess many advantages. The clay is here in abundance. The water in the mine that has to be pumped out would be plenty to run the necessary machinery and mix the clay, and the coal would furnish fuel to burn all the pottery that can be made. Fuel is a big item of expense in the pottery business, each kiln operated costing in the neighborhood of \$2,000 per annum; at least two-thirds of that expense could be saved there and added to the profits of the concern. It is understood to be a good paying business, even where all the material, clay, water, fuel, etc., are obtained at great cost. It would seem a splendid opportunity for capitalists to take hold of this thing and build up a permanent and paying business. If a company will form and take hold of it, the owner, we understand, will put the property in at a very reasonable figure, and take any share desired, from one-tenth to one-third interest. Capitalists looking for safe investments would find this matter well worth a consideration at least.—*Placer Herald*.

**RIVER MINING.**—The Oroville *Mercury* says: Feather river is turning out a golden harvest this year, such as she never did before, if we except the year when the old Cape claim was worked. Near Long Bar a few men took out \$500 in a short time, after getting the bed of the river dry. At another point two men took out \$175 in 24 hours, or rather the part of it that they worked. Still further up one may see little squads of men at work, and in every place, so far as we can learn, they are doing better than ever before. The river is so low that it does not require much work to turn or flume it, and thus leave the bed bare and dry. Every old miner had in view some spot that he deemed rich, and expected to make his "pile" there if ever it came so that he could get rid of the water. This is his year, and it is amusing to see with what high hopes they are at work. The very best evidence that we have of his good judgment and industry is the large amount of dust they bring in and offer for sale. There are yet several companies that have not yet made any report of their progress. There is one on the Middle Fork, consisting of L. Delevan, J. C. Bierce, D. Paxton and others that is in the latter class. We confidently believe that the first rise in the river will send them down with a large quantity of dust, for they are in a place that has long been thought to be very rich. Below town the Chinese are taking out large quantities of dust, and there are thousands of them at work. In one claim the receipts each month are not less than \$15,000, while it may come nearer \$20,000.

### Early History of the Overman Mine.

The testimony of John Overman, one of the original locators of the Overman mine, has been taken before Judge Rising, of the First Judicial District Court of Nevada. This was done at the instance of the Overman company, Mr. Overman having come from Iowa on purpose to testify. His deposition is now on record and is as follows:

The Overman claim was located about the 9th of September, 1859, in the Gold Hill mining district. The locators were John Overman, William Brink, A. B. Hoover, and J. M. Overman, son of John Overman. The northern stake of the claim was placed at the southern boundary of what was known as E. E. Belcher & Co.'s claim. Each locator claimed 300 feet, and the claim consisted of 1,200 feet. Work was commenced 10 or 15 days after the location. The claim was located as the extension of the Crown Point and Belcher ledge, and all the work done on the claim by the locators was with the view of developing the Crown Point ledge. Work was commenced about the 15th of September by starting a tunnel, which was at first called the Emigrant tunnel, and afterward the Overman tunnel. When it was sold to the Hawkeye company it was called the Hawkeye tunnel. A shaft was sunk on the boundary of the Belcher and Overman, each party of the locators paying half the expenses. Up to June, 1863, the tunnel had been run into the mountain about 700 feet.

At the time of the location of the Overman ground there were no other claimants to the ground and no conflicting claims. The Overman company never abandoned their location or relinquished possession of the same. John Overman held his interest in the claim until July, 1863. The notice of location was recorded in Gold Hill, and a true copy is annexed to this testimony and marked "Exhibit A," as follows:

#### Notice.

We, the undersigned, have this day staked up notice on a claim on the 9th September, 1859, 1,200 feet south of E. E. Belcher & Co.'s claims—his claim being south of Crown Point. Three hundred feet to the share on this lead.

JOHN OVERMAN,  
WILLIAM BRINK,  
A. B. HOOVER,  
JOHN M. OVERMAN.

Recorded 7th October, 1859.

EDWARD MORSE, Deputy Recorder.

While running the Hawkeye tunnel some quartz was struck which was not thought to be the Crown Point ledge, but was believed to be the Ne Plus Ultra or Cedar Tree ledge, which were believed to run east of the Crown Point ledge.

The Cedar Tree, Hit or Win and Ne Plus Ultra claims were east of what the Overman locators considered as their ledge; while the Hawkeye ledge was 300 to 500 feet west of what was considered as the Overman ledge.

In 1863 deponent sold his interest to Caldwell, Crane, Gossage, Head and others, and retained an interest of 10 shares, which was sold after his departure.

Deponent was born in Wayne county, Indiana, and is 61 years old; a farmer, and has resided in Vapello county, Iowa, since 1863. Himself and co-locators were in the exclusive possession of the entire Overman claim from the time of its location until June, 1863.

During the first 90 days after the location the tunnel was run about 160 or 170 feet, the work being then worth from \$5 to \$7 per linear foot. Up to 1862 the tunnel was extended about 500 feet.

Down to 1862 the original Overman, or Hawkeye tunnel, was run about 500 feet. The tunnel near Pedarbridge's slaughter house was begun in the spring of 1862, and work carried on until June, 1863. The distance run was about 700 feet, at a cost of five to seven dollars per foot.

Deponent recently examined the locality of the Overman claim, to find out the north and south lines of the claim, the locality of the old Segregated Belcher or Apple shaft, and the locality of the two tunnels, of 500 and 700 feet in length, previously mentioned. A map herewith annexed as "Exhibit B" is correct, so far as the Hawkeye tunnel, the Overman and the north stake are represented thereon. As to other points on the map he cannot say whether or not they are correct.

The Overman notice was posted east of the Segregated Belcher shaft, at about the distance designated on the map. The notice was posted about the head of the cut. As a Mr. Kanor wanted to locate at the south boundary of the Overman, in the fall of 1860, 1,200 feet were measured off a little south of west from the Belcher line, in the low ground between the old American Flat trail and the toll road leading to Silver City, from a stake stuck at random about 200 to 300 feet west and southerly of the Dardanelles shaft. Deponent did not know in what direction the ledge ran; everybody was "going it blind" at the end, south of the Belcher.

While working in partnership with the Segregated Belcher or Apple shaft company, the joint shaft was sunk 20 to 30 feet and a cut was run into the hill some 15 or 20 feet.

John M. Overman, A. B. Hoover and William Brink, the co-locators of the Overman claim with deponent, were citizens of the United States at the date of the location. Hoover was born in Indiana and was John Overman's nephew, and 23 years old at the time. J. M. Overman is deponent's son. Brink was

a Pennsylvanian by birth and about 30 years old at the time of the location.

In his cross-examination the witness stated that during his connection with the Overman company what was believed to be the Crown Point ledge was not struck, although there was quartz struck in the Hawkeye tunnel, at a point about 175 or 200 feet west of the mouth. The south line of the Overman was not defined until the fall of 1860, when the ground was measured off and a stake planted. But two or three weeks afterward witness went down to look after the stake, but it had been removed. When the ground was measured off the ledge had not been traced. It was the south stake that was 200 or 300 feet south of the Dardanelles shaft. This shaft was not there at the time, but witness supposes, from his knowledge of the configuration of the country, that the stake was placed at that point.

Witness could now go out to the locality and come within 100 feet of the spot where the south stake was located. The shaft sunk in partnership between the Belcher and Overman was about where the Overman north stake is located on the map. The other Segregated shaft marked on the map, was commenced about the time that witness left the country, in June, 1863. The Segregated Belcher shaft was to the west.

Re-direct.—When witness placed the south stake he made no declaration, although he claimed the Crown Point ledge, wherever it might run.

### Base Metal Mines.

Among prospectors and other mining men of small means a good deal of talk about base metal mines is now heard. By base metal mines is meant such as contain ores that are a mixture of lead, iron and silver, with, perhaps, a small per cent. of gold—ores that cannot be worked by the ordinary mill process, but must be smelted. The base metal mines are about the only ones outside of the Comstock and the Grand Prize, Tuscarora, that are paying. Formerly prospectors in the eastern part of the State were all in search of mines that would yield free milling ores, and would hardly stop to look at a base metal lode; now, however, it is just the other way. The cost of transporting heavy engines, bed plate, wheels, pans, boilers and other machinery required in the construction of a mill far into the country, over sandy plains and rugged hills, is so great that it is a difficult matter to find capitalists who are willing to undertake such enterprises on the strength of any ordinary showing of ore. A base metal mine, on the contrary, requires no such heavy and expensive machinery. An engine of two or three horse power, weighing but a few hundred pounds, for furnishing the blast for the furnace, is all that is required in the start. Indeed, when ores that will pay for shipping are found, men that have no other capital than muscle may at once begin to make money. Not a few men are now working mines in this manner, sending their ores to California for reduction. In this way they soon get money enough ahead to put up a small furnace, when they are quite independent. Uncle Billy Raymond, at Lodi, and the Downey boys, four or five miles from the same place, are working their mines to a profit, though as yet they are shipping their ores to Sacramento. The ore is hauled to the railroad for \$25 per ton by teams returning from Belleville, and other places in that direction, to Wadsworth, when a car is loaded and sent over the mountains. In this way they have been clearing about \$400 per ton on the ore shipped. They ship only their richest ore, as they expect soon to have furnaces at their mines, where they have ore piled up that will pay as high as \$200 per ton. All cannot expect to find as rich mines as those mentioned, yet the chances appear to be very good for finding lodes that, with a small furnace and the labor of three or four men at mining, burning charcoal and smelting, would pay much more than wages. Miners are beginning to see this and are looking up the base metal leads which they formerly considered worthless. The limestone or base metal range certainly appears to be a better place for men of little means than is this region at the present.—*Virginia Enterprise*.

**MEANS OF PRESERVING MILK.**—At a recent meeting of the American Dairymen's Association, Prof. Caldwell, of Cornell University, read a paper entitled "Boric Acid and other Substances for Preserving Milk." Prof. Caldwell spoke of various substances for this purpose. He had tested various antiseptics for the preservation of milk, and found that boric acid was better than anything he had tried. When milk soured in from 20 to 24 hours, at a temperature of 80° Fahr. and upward, one part of boric acid added to 500 parts milk caused it to remain sweet for 50 hours. At a temperature of from 72° to 79°, one part of boric acid to 1,000 parts of milk, by weight, kept it sweet 50 hours. He applied it to milk warm from the cow, and thus preserved it twice as long as it would keep without it. No injury to the quality of the milk occurs in using one part of boric acid to 1,000 parts of milk. He stated that it was not a poisonous substance; he had taken the milk thus preserved into his own stomach and experienced no harm therefrom. One pound of boric acid to 1,000 pounds of milk will keep it sweet twice as long as it would keep without it.



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(Continued from page 213.)

the Fox for \$5,000. This is the second heavy mining transaction we have had during the month, and it looks as if that long wished for capital, which is to develop our mining resources, is at last slowly finding its way into our midst.

**BO CHUNK.**—Arizona Miner, Sept. 21: John Ellis, of Alexandria, came in to-day, and brings cheering news from the Black Warrior. Mr. Raine went out a few days ago to commence work, and Mr. Ellis informs us that they put in that yesterday which loosened up a chunk of ore that will weigh at least 500 pounds, and that those who have examined it think it will assay over \$5,000 to the ton.

**CUSTOM MILL.**—The need of a custom mill in Prescott to work silver and gold ores has long been recognized, but no one has as yet moved in the matter of its erection. A large number of mines in all directions, and at various distances, each in itself too small to warrant the building of a mill, but all of which would furnish considerable quantities of good ore if they could have it worked here in town, where their owners, many of whom are farmers and stockmen, are obliged to come for supplies, and could load their wagons with ore, rather than bring them in empty, and thus the matter of hauling would be but nominal.

## Idaho.

**THE MINES.**—Owyhee *Avalanche*, Sept. 29: It is rather encouraging to note that business has undergone a slight improvement during the past month, with every prospect that operations will be carried on on a much larger scale during the coming winter than the past. The Knott mine, on Florida mountain, has been recently purchased by John Catalow and others. John F. Cassell, Esq., a well-known mining operator, formerly Superintendent of the Golden Chariot, arrived here on Wednesday from San Francisco. He examined the Florida mountain ledges, and it is reported that he expressed himself fully satisfied with the purchase made by Mr. Catalow, in which he and Mr. Grayson are reported to be interested.

**EMPIRE.**—At the Empire work is progressing very satisfactorily. The shaft is down a depth of 51 feet below the 7th level, and progressing at the rate of about 12 feet per week. There is every indication that an immense ore body will be encountered on the 8th level, as it is certain that two or more ledges will come together at that point, and the belief is general among competent judges that this development will be an important one.

## Oregon.

**GRAVEL.**—Oregonian, Sept. 29: On the middle fork of Cow creek there is a bed of rich gravel from 30 to 70 feet deep, and of a blue color, a favorite with miners. Water is taken from Middle Cow creek and conveyed to the diggings by a ditch six miles in length and 150 feet above them. With this head the piling away of the gravel bank will be an easy matter. The dirt prospects well from the top down.

At the Payallup mine the main tunnel is in 450 feet, and other tunnels a less distance. Two or three hundred tons of coal are ready for shipment, some of which has been exposed to the atmosphere for six months and is to-day as fine looking as it was when brought out of the pit.

At the mine just opened by Judge Tolman and others, on the middle fork of Cow creek, 40 Chinese are at work. The ditch, when completed, will be four and a half miles long. Hydraulic pipe and fixtures have been ordered from San Francisco, and everything will be in readiness within 40 days.

**CINNABAR.**—Jacksonville Times, Sept. 22: A new and immensely rich deposit of cinnabar was discovered on Beaver creek, on the ground owned by the Elkhorn quicksilver mining company, one day last week. The ledge is about 18 inches wide and is almost pure cinnabar. The company owning this mine expect to build a furnace next spring, and are confident that they have a big thing.

## Utah.

**SANDY.**—Cor. Salt Lake Tribune, Sept. 29: Some few persons here look upon the closing down of the Flagstaff smelter as the death knell to Sandy's future, but to a thinking person or any one who will look around and see for himself, he will be convinced that Sandy's future never looked better.

The Pioneer sampling mill and the Sandy sampling mill are both making several improvements to meet a large increase of business this coming fall.

When a person looks around the Mingo company's works, and sees about 100 men employed in tearing down and building up, with a view of extending their works from two stacks to four, and erecting large roasters, and new engines with double the power, and many of the latest improvements, the skeptical one will be convinced that the men who are doing this at a large outlay of money, know what they are about, or they would not undertake it. When these improvements are completed, a large number of men will necessarily be employed, and those who look forward to see dark days for Sandy will have to stand aside for the go-ahead men we have amongst us.

**STOCKTON.**—Our little camp is already awakening from the long night of business depression, and we feel confident that soundings have been found at last, and better times are in store for winter season. In addition to the few mines that have been worked this summer, several more have started up within the last few days, and the hardy miners are rolling out the argentiferous regardless of the low price of lead.

## New Incorporations.

The following companies have filed certificates of incorporation in the County Clerk's office at San Francisco:

**THE WHITE LEAD M. Co.**—Sept. 29th. Location: Gold Hill, Nevada. Trustees—D. L. McDonald, A. Kohler, C. Shad, B. L. Schmidt and P. J. White. Capital, \$10,000,000.

**THE CHRISTY M. & M. Co.**—Sept. 29th. Location: Humboldt, M. district, Washington county, Utah. Trustees—O. P. Griffin, W. H. Graves, John H. Wise, W. M. Lubbock. Capital, \$3,000,000.

**THE DIANA G. & S. M. Co.**—Oct. 3d. Location: Elko county, Nevada. Directors—F. M. Smith, L. W. Crane, C. M. Peck, J. W. Hussey and M. D. Howell. Capital stock, \$10,000,000.

**THE TUSCARORA CON. M. & M. Co.**—Sept. 29th. Location: Tuscarora M. district, Elko county, Nevada. Directors—M. Mayblum, A. Fiesbacher, S. B. Palmer, J. F. Schafer and J. S. Doe. Capital Stock, \$10,000,000.

The capacity of the California battery mill, at the C. & C. shaft, is being increased by the addition of twenty stamps. The work will be completed in about 30 days. At present 60 stamps are employed crushing 350 tons of ore per day. When the additional stamps are started up the crushing capacity of the mill be 460 tons per day.

The first United States' patent was issued to Samuel Hopkins, on July 14th, 1790, "for making pot and pearl ashes." Up to 1836, 46 years, 10,301 patents were issued, and to date over 195,000. The annual number of patents granted is about 14,000. The annual receipts of the Patent Office are about \$800,000, and expenditures \$660,000.

The San Francisco mint coined in September \$4,516,000, of which \$1,275,000 was trade dollars, \$108,000 in halves, \$110,000 in quarters and \$3,000 in dimes. The sum of \$3,020,000 was in twenty-dollar pieces.

## Save the Salmon.

The daily papers for a week past have been laden with articles to show that the laws for the preservation of salmon during the breeding season were being transgressed by the canning factory at Collinsville. The matter was brought up first by the Antioch Ledger, two or three weeks ago, and though there has seemed to be a general impression that the factory was being run with unlawful catch, there was difficulty in getting evidence upon which to arrest the owners of the cannery. After the agitation in the newspapers began, the owners of the cannery, Emerson Corville & Co., were arrested at the instance of the Fish Commissioners and the hearing of the case postponed until Saturday of this week.

The matter is enwrapped in some obscurity, although there seems no doubt among those who have facilities for knowing that the wrong has been done. The Bulletin has examined the question and the effects of the illegal practice, and writes as follows: "The District Attorney of Solano county, assisted by special counsel employed by the Commissioners, will conduct the prosecution. The case is a plain one against the offenders. They have thus far made no effort to deny that they are engaged in this unlawful business. The penalty ought to be the heaviest that the law provides. No trifling penalty will be satisfactory. It is estimated that these men have already destroyed over 50,000 seed salmon on which the future of the California salmon fisheries in a great measure depended. They have gone in to make a fortune through the violation of a law which honest men have respected. The penalty ought to be commensurate with the magnitude of the offense. The Fish Commissioners have unselfishly devoted their time for the past five years in stocking the streams of California with fish. They have done this without remuneration. Their labors were this season hearing fruit. It is the first year since the artificial hatching of salmon was begun that the run of fish up the Sacramento has been large enough to justify the erection of canneries. By natural breeding, only about 5% of the ova of the fish is hatched, while from 95% to 98% is the result of artificial breeding. If the fish are allowed to run to the spawning grounds during the spawning season, the supply may be perpetuated through the agency of the hatchery on the St. Cloud. The law providing for the suspension of fishing during three months of the year, commencing August 1st, was framed to suit the wants of the fishermen. A conference for that purpose was held before its passage, between the Senate Committee, the Commissioners and a number of leading fishermen. The law as it now exists was the result of that conference."

We print a statement which is ostensibly written in the interest of the fishermen and giving their view of the law. We are not experts in the matters involved, and do not attempt judgment on some of the points, but we believe fully and earnestly in the wisdom of giving the fish a chance to reproduce their kind, for it is a plain fact of experience along all rivers that the best fish may soon become wholly destroyed by constant and ungodly taking of them. We notice that one of the Commissioners, Mr. Redding, of Sacramento, has written a letter to the Commercial News, which controverts some of the positions taken by our correspondent, to whose letter we have alluded. We quote: "When the fish first come in from the ocean, they are of a superior flavor and quite fat, and showing a layer of white curd between each layer of flesh. As the salmon does not eat in fresh water after it comes in from the ocean, the eggs and milt are matured at the expense of the fat and muscular vitality of the fish. Soon after the first of August the eggs and milt mature, the white fat and curd disappear, the silvery scales are absorbed, and the skin turns black. It is then as unfit for human food, and as feverish, as a hen would be taken from her nest. The canneries on the Columbia river cease work on the first of August, as it has been found that salmon canned after that date have so deteriorated as to injure the reputation of the whole season's catch in foreign markets. It is reported that canneries on the Sacramento have been at work catching and canning over-ripe fish since the first of August. The effect will be to reduce the reputation of the Sacramento salmon to second and third-class. It is unfortunate, as this is the first year these fish go extensively into foreign markets, and great care should have been taken that only perfect fish, not over-ripe, should have been sent abroad from the Sacramento. It is to be hoped that next season the canneries will repair their error, by catching and canning only during the season, when the fish are in perfect condition, and during the time when proper and wholesome laws provide they may be caught."

## The Fishermen's Statement.

**EDITORS PRESS.**—Your representative called on me on the 26th ult., and requested me to forward you my views and experience relating to the salmon law in this State, as you were desirous to ventilate the question, and through your columns enlighten the masses on this important subject. Gents, I have canvassed the fishermen in this immediate neighborhood, and should you publish this, you are authorized to state that it embodies the views of all the fishermen on the upper Sacramento river.

The salmon law, making August, September and October close months, was framed in evident ignorance of the habits of the fish and the manner of taking them.

1st. The nets used in this river are of a uniform size mesh, viz., eight-inch. There is no law as to nets here, but a net that would hold a five-pound fish would be too small to admit a 12-pound fish, therefore the eight-inch mesh has been adopted as best fitted to catch the average sized fish, 16-pound, and no fish under nine pounds in weight or over 30 pounds can be caught in it. Thus we allow over one-half the fish to escape our nets altogether.

2d. As the fish only come in the river to spawn, the close time should properly be when the spawn is ripe; but there are two distinct kinds of salmon in this river, which leave the sea at very different times. The first run lasts from March until the end of July, and is left to the mercy of the fishermen altogether. The later run is from about August 15th until October 20th, and is a fish with a marked hooked jaw—the under jaw receding like a pig's. It has a long head, and more spots on it than the first run. We call it the hook-mouth, or black salmon, and it has never been seen in the river before August. Thus it will be seen that it is only this variety that is at all preserved by the law, and, in consequence of the current being so slack, and so little water in the river, it is very difficult to catch this fish at all. The meat of this fish is much harder and finer than the early salmon.

The month of July, and that alone, is the proper close month, as then the spawn of the main body of fish is ripe, and, the weather being so warm, the fish is soft, and not fit either to salt, can or eat, but, as the river is so shallow, and there are so few good drifts where we can catch the fish, there is no necessity to preserve the fish at all. People have been saying that there was a scarcity of fish this year; granted, but it was entirely on account of the drought. The fish could not get up the river; there was not enough water for them all, as each fish requires sufficient water to furnish it food. I am only a fisherman, and not scholar enough to put my knowledge of this subject in a scientific article, but my knowledge comes from 20 years' practice. In behalf of 50 salmon fishermen of the Sacramento river. T. T. WILLIAMS.

**LADY BRYAN.**—A meeting of the dissatisfied stockholders of the Lady Bryan mine was held on Saturday evening in the Fourth District Court-room. Dr. H. S. Stone occupied the chair, and Mr. Gardner acted as Secretary. The Chairman explained that a suit had been brought against Dr. Sigesmond to recover possession of 14,500 shares of stock belonging to the dissatisfied members and placed in his (Sigesmond's) hands as custodian, with four others, to take action against the management, and which he now refuses to return. It was also stated that the Lady Bryan stock had been withdrawn from both the San Francisco and Pacific Stock Boards, and that the mine had been banded for \$130,000 by John Tyler, Jr., who was anxious to obtain possession of the stock. A notice, signed by S. B. Sigesmond, was read, stating that the certificates of stock held by him had been levied upon out of the Nineteenth District Court in an action commenced by Dr. Stone, and recommending the stockholders take such action in the matter as they pleased. As Dr. Sigesmond had not handed over the stock held by him, in compliance with a resolution at the last meeting, it was moved by Dr. Keitz that he be expelled from the meeting for contumacy. The motion was carried, and Sigesmond left the room amid considerable confusion. On motion of Mr. Stone, it was resolved that all the parties who held Sigesmond's receipts for stock take them to the Secretary and have them exchanged. The meeting then adjourned.

**BULLION SHIPMENTS.**—Since our last issue shipments of bullion from prominent mines have been as follows: California, Sept. 26th, \$208,672.08—total to date, \$875,794.36; Standard, Sept. 25th, \$41,589.65; Northern Belle, Sept. 23d, \$10,575.13; Leopard, Sept. 25th, \$5,000; Northern Belle, Sept. 27th, \$9,094.65; Arizona, Sept. 29th, \$1,492.85; Northern Belle, Sept. 25th, \$8,953.74; Minnetta Belle, Sept. 28th, \$2,000; Raymond & Ely, Sept. 20th, \$7,291.99; Endowment, Sept. 29th, \$2,991.60; Con. Virginia, Oct. 1st, \$222,386.99; California, Oct. 1st, \$296,662.53; Martin White, Sept. 23d, \$6,583.79; Northern Belle, Sept. 30th, \$11,557.96; Arizona, Oct. 1st, \$3,923.92; Leopard, Oct. 3d, \$3,500.

Most of the finest buildings in San Francisco owe their origin to the mines. The Palace hotel, Baldwin hotel, the Nevada block and the new Stock Exchange are probably four as fine buildings as there are in the city and each of them was built with Comstock silver and gold. These are only a few of those which could be mentioned in this connection.

It is reported that the Leeds mining company will probably increase the dividend this month. The ore is improving in value, and the supply is unlimited. More pans will be put in with an auxiliary engine.

**ALBERT A. HICKOX**, a stock broker of this city, filed a petition in bankruptcy in the United States District Court yesterday. His liabilities are set down at \$27,073.58—assets \$2,757.69.

## Book Notices.

**WEEKS ON MINERAL LANDS.**—Since the publication of Gregory Yale's work on "Mining Claims and Water Rights," in 1867, we have had no extended treatise on this important subject. The compilation of Mr. Skidmore and Mr. Copp, though both are useful, do not attempt any comments or explanations of the laws of mines. Mr. Weeks' treatise is a systematization and condensation of the materials which constitutes the law relative to the mineral lands of the United States from the date of the first mining Act in 1866, to the present. These materials consist principally of the various Acts of Congress, the Revised Statutes of the United States, the decisions and resolutions of the Commissioner of the General Land Office and Secretary of the Interior, the opinions of the United States Attorney Generals, and the decisions of the courts on the subject. It embraces full discussions of the following subjects: 1st, Introductory. The Legislation of 1866 and its interpretation. 2d, Reservations and Exceptions of Mineral Lands. 3d, Rights of Exploration and Purchase (herein of Citizenship, Corporations, etc.). 4th, Dimensions of Claims, Location, and Possession under the Acts. 5th, Tunnel Rights. 6th, Regulations, Expenditures, Improvements. 7th, Patents. 8th, Adverse Claims. 9th, Placer Claims. 10th, Surveys. 11th, Intersection of Veins. 12th, Mill Sites. 13th, Water and other Vested Rights. 14th, Homesteads and Town Sites. 15th, Segregation of Mineral and Agricultural Lands. 16th, Coal Lands. 17th, General Power and Authority of the Land Department, Appeals, Evidence, and various miscellaneous topics. The book is intended more particularly for the use of lawyers; is bound in "legal calf," and published by Sumner Whitney & Co., in this city. It is the most valuable treatise on the subject we have, bringing everything up to the present time.

**PROF. HAYDEN'S ANNUAL REPORT FOR 1875.**—This is the ninth annual report of the U. S. Geological and Geographical Survey of the Territories, embracing Colorado and parts of adjacent Territories, being a report of progress of the exploration for the year 1875, by F. V. Hayden, U. S. Geologist. This volume completes the southern and southwestern portions of Colorado, and includes a belt 15 miles in width of northern New Mexico and eastern Utah. The force of the survey was divided into seven parties. The areas for exploration were further from the base of supplies than heretofore, rendering the labor greater, but the amount of topographical and geological work accomplished has not been exceeded by any previous year. The report comprises more than 800 pages, and contains a great deal of valuable information not otherwise available. The delay in the publication of the annual report for 1875 has been produced by causes beyond Professor Hayden's control. The great increase of labor incident to the Centennial Exposition drew away much of the force that would otherwise have been expended in the preparation of reports. The annual report of 1876 will follow the present one in a few months.

**USE OF BELTING.**—This is a treatise on the use of belting for the transmission of power, by John H. Cooper. The book contains numerous illustrations of approved and actual methods of arranging main-driving and quarter-twist belts, and of belt-fastenings. Examples and rules in great number for exhibiting and calculating the size and driving power of belts; plain, particular and practical directions for the treatment, care, and management of belts; descriptions of many varieties of belting, together with chapters on the transmission of power by ropes; by iron and wood frictional gearing; on the strength of belting leather; and on the experimental investigations of Morin, Briggs and others for determining the friction of belts under different tensions, which are presented clearly and fully with the text and tables unabridged. The book is written in the plainest language and is exhaustive in character, being, indeed, worthy of a place in every workshop in the country where belts are used. The publishers, Claxton, Remsen & Haffelfinger, 628 Market street, Philadelphia, will send copies by mail, post paid, for \$3.50. The book comprises 310 pages, and is copiously and minutely indexed.

**THE CHEMISTS MANUAL.**—This work is a practical treatise on chemistry, qualitative and quantitative analysis, stoichiometry, blow-pipe, analysis, mineralogy, toxicology, etc., by Henry A. Mott, Jr., E. M., Ph. D., (Van Nostrand). This work will serve as a useful reference book for the general scientific readers, and possesses a special value for the students and laboratory worker. It contains a judicious selection of the most important methods, most of which have been tested by laboratory experience and found to give satisfactory results. These are presented in a concise form with reference to original authors. The numerous table of constants will also be found of great value. The author has accumulated from time to time a large number of valuable notes and tables which he now publishes; so that all the matter has practical value attached to it. A copious and well arranged index is presented, so the work forms one of ready reference. Everything is in a very condensed form and the work is really a valuable one for those interested in any way in chemistry. For sale by Bancroft & Co.



## General News Items.

THE Patent Office fire was entirely accidental. There is no proof whatever of an incendiary attempt.

THE property left by Thiers, besides his library and objects of art, which are left to the State, is estimated at about \$2,700,000.

THE Secretary of War, in his annual report, will recommend that the army be increased to 40,000 men. The English battalion system will also be recommended.

DIVIDENDS were paid by local incorporations last month to the amount of \$2,963,000. The October disbursements will probably be still larger, as some quarterly dividends are to come into the account.

CHARLES CROCKER, the railway magnate, has suggested an excellent method to provide temporary work for the unemployed. He has offered to be one of 50 to subscribe \$1,000 each towards building a new two-mile drive in Golden Gate park.

On the 30th ult., the regular passenger train crossed the new bridge over the Colorado river, landing the United States mails, passengers and express on Arizona's soil. Hereafter all trains will arrive and depart from the depot in Yuma instead of via the ferry, as heretofore. The change is hailed with joy by all, as the transfer by ferry was very annoying as well as expensive. It is generally believed that the company will soon commence the construction of the road up the valley of the Gila, thus developing the opening of the rich mines in the interior of the Territory.

THE INFLUENCE OF THE CENTENNIAL.—We have already noted the spirit of increase and activity which was breathed into many branches of our manufacturing industries by the display given to our goods at the Centennial. It is gratifying to California agricultural producers to learn of movements in other lines in which they are more directly interested. The following note is from the Philadelphia Bulletin: American wines are being exported in considerable quantities since the Centennial exhibition. Foreigners were surprised at the progress made in viticulture in this country, and the superior quality of many of the American wines on exhibition, particularly those of Ohio, Missouri, New York, New Jersey and California. Hardly any article of American production of a superior quality was on exhibition at the Centennial which has not since been exported abroad.

EASTERN OUTLOOK.—The St. Louis Journal of Commerce says: The people of this country are certainly not in danger of actual starvation. The granaries of the West are overflowing. Fat cattle and fat hogs come after full corn cribs. The oyster men of the East unite in saying that for years there has not been so good a prospect for an abundant supply of oysters, and it is said they will be fine in quality and cheap as to price. We can trade corn and wheat for oysters and things, and worry the winter through right comfortably.

METEOROLOGICAL SUMMARY FOR SEPTEMBER.—The report of the U. S. Signal Service officer, of San Francisco, for the month of September is summarized as follows: The mean height of barometer for the month was 29.92; mean temperature, 61°; mean humidity, 71; prevailing winds southwest; highest barometer, 30.114; lowest, 29.775; highest temperature, 92°; lowest, 51°; monthly range, 41°; greatest velocity of wind, 24 miles per hour; total number of miles traveled by wind, 6,939.

Mr. J. W. Mackay, of the bonanza firm, has returned to the Comstock from Paris, where he has been with his family for the past five months.

In the suit of R. F. Knox vs. the Great Western quicksilver mining company judgment has been given for plaintiff.

## Signal Service Meteorological Report.

WEEK ENDING OCTOBER 2, 1877.

HIGHEST AND LOWEST BAROMETER.						
Sept. 20	Sept. 27	Sept. 28	Sept. 29	Sept. 30	Oct. 1	Oct. 2
30.01	29.95	29.94	29.91	29.97	30.06	30.10
20.03	29.86	29.87	29.86	29.80	29.90	30.03
MINIMUM AND MAXIMUM THERMOMETER.						
71	75	71	65	65	64	63
57	75	64	55	51	53	50
MEAN DAILY HUMIDITY.						
67	64	76	67	65	60	58
PREVAILING WIND.						
SW	SW	SW	W	W	W	W
WIND—MILES TRAVELED.						
164	131	247	174	321	104	254
STATE OF WEATHER.						
Clear.	Clear.	Clear.	Clear.	Clear.	Clear.	Clear.
RAINFALL IN TWENTY-FOUR HOURS.						
Total rain during the season, from July 1, 1877, 0.02 in.						

MORSE'S Palace of Art is no misnomer, for the beautiful gems produced at No. 417 Montgomery street, are not excelled in the world, if equaled by any.

WOODWARD'S GARDENS has the following new attractions: The buffalo chair; large whale skeleton; new museum; improvements in the zoological department, besides the other features which have made it popular.

## GENERAL MERCHANDISE.

(WHOLESALE.)

WEDNESDAY M., October 3, 1877.

BAGS—Jobbing.		Plaster, Golden	
Eng Standard Wheat, 11½¢	11½¢	Gate Mills, 3 00	@ 3 25
Neville & Co's	11½¢	Land Plaster, 10 00	@ 12 50
Hand Sowed, 22½¢	11½¢	SALES.	
21½¢	11½¢	Assorted Sacks, 3 25	@ 4 00
Machine Sd, 22½¢	10½¢	OILS.	
Flour Sacks, 10½¢	10½¢	Pacific Glue Co, 1 00	@ 90
Quarters, 5½¢	8½¢	Neatfoot, No 1, 1 00	@ 90
Barrels, 4 00	4 00	Castor, No 1, 1 00	@ 90
Hessian, 60 inch, 1 14	1 14	Do, No 2, 1 00	@ 90
45 inch, 9½¢	9½¢	Baker's A, 1 25	@ 1 30
40 inch, 8½¢	8½¢	Oliver, Magnolia, 1 25	@ 1 30
Hand Sowed, 3 10	42¢	Powell, 1 25	@ 1 30
Machine Sowed, 42¢	42¢	Palu, B, 5 00	@ 5 00
Standard Gunnies, 18½¢	18½¢	Lined, Raw, 10 00	@ 10 00
Bean Bags, 6½¢	6½¢	Boiled, 80 00	@ 80 00
CANDLES.		Cocoanut, 65 00	@ 65 00
Crystal Wax, 17 17	17 17	Coconut, 65 00	@ 65 00
Eagle, 12½¢	12½¢	Coconut, 65 00	@ 65 00
Patent Sperm, 27 00	27 00	Coconut, 65 00	@ 65 00
CANNED GOODS.		Coconut, 65 00	@ 65 00
Assorted Pie Fruits,		Coconut, 65 00	@ 65 00
2 1/2 cans, 2 75	@ 3 00	Coconut, 65 00	@ 65 00
Table do, 3 75	@ 4 25	Coconut, 65 00	@ 65 00
Java and Jellies, 4 25	@ 4 25	Coconut, 65 00	@ 65 00
Pickles, 1/2 gal, 5 50	@ 5 50	Coconut, 65 00	@ 65 00
Sardines, 60 box, 1 65	@ 1 80	Coconut, 65 00	@ 65 00
Hf Boxes, 3 00	@ 3 00	Coconut, 65 00	@ 65 00
Preserved Beef,		Coconut, 65 00	@ 65 00
2 1/2 doz, 4 00	@ 4 00	Coconut, 65 00	@ 65 00
do Beef, 1/2 doz, 6 50	@ 6 50	Coconut, 65 00	@ 65 00
Preserved Mutton,		Coconut, 65 00	@ 65 00
2 1/2 doz, 4 00	@ 4 00	Coconut, 65 00	@ 65 00
Beef Tongue, 5 50	@ 5 50	Coconut, 65 00	@ 65 00
Preserved Ham,		Coconut, 65 00	@ 65 00
2 1/2 doz, 6 50	@ 6 50	Coconut, 65 00	@ 65 00
Deviled Ham, 1 1/2		Coconut, 65 00	@ 65 00
do Ham, 1 1/2 doz, 6 50	@ 6 50	Coconut, 65 00	@ 65 00
COAL—Jobbing.		Coconut, 65 00	@ 65 00
Australian, ton, 9 00	@ 9 50	Coconut, 65 00	@ 65 00
Coast Bay, 7 00	@ 7 00	Coconut, 65 00	@ 65 00
Bellingham Bay, 7 00	@ 7 00	Coconut, 65 00	@ 65 00
Seattle, 7 00	@ 7 00	Coconut, 65 00	@ 65 00
Cumberland, 14 00	@ 14 00	Coconut, 65 00	@ 65 00
Mt Diablo, 17 00	@ 17 00	Coconut, 65 00	@ 65 00
Lehigh, 22 00	@ 22 00	Coconut, 65 00	@ 65 00
Liverpool, 8 50	@ 9 00	Coconut, 65 00	@ 65 00
West Hartley, 8 50	@ 9 00	Coconut, 65 00	@ 65 00
Scotch, 8 25	@ 9 00	Coconut, 65 00	@ 65 00
Seranton, 8 25	@ 9 00	Coconut, 65 00	@ 65 00
Vancouver, 13 00	@ 16 00	Coconut, 65 00	@ 65 00
Charcoal, sack, 75 00	@ 75 00	Coconut, 65 00	@ 65 00
Coke, bbl, 60 00	@ 60 00	Coconut, 65 00	@ 65 00
COFFEE.		Coconut, 65 00	@ 65 00
Sandwich Id, B, 21½¢	@ 21½¢	Coconut, 65 00	@ 65 00
Costa Rica, 18 00	@ 20 00	Coconut, 65 00	@ 65 00
Guatemala, 18 00	@ 20 00	Coconut, 65 00	@ 65 00
Java, 25 00	@ 25 00	Coconut, 65 00	@ 65 00
Manilla, 19 00	@ 19 00	Coconut, 65 00	@ 65 00
Ground, in cs, 25 00	@ 25 00	Coconut, 65 00	@ 65 00
FISH.		Coconut, 65 00	@ 65 00
Sect to Dry Cod, 5 00	@ 5 00	Coconut, 65 00	@ 65 00
do la casis, 5 00	@ 5 00	Coconut, 65 00	@ 65 00
Eastern Cod, 7 00	@ 7 00	Coconut, 65 00	@ 65 00
Salmon, bbls, 9 00	@ 10 00	Coconut, 65 00	@ 65 00
Hf bbls, 10 00	@ 10 00	Coconut, 65 00	@ 65 00
2 1/2 cans, 3 10	@ 3 20	Coconut, 65 00	@ 65 00
Pkld Cod, bbls, 2 00	@ 2 00	Coconut, 65 00	@ 65 00
Hf bbls, 11 00	@ 11 00	Coconut, 65 00	@ 65 00
Mackerel, No 1, 10 00	@ 10 00	Coconut, 65 00	@ 65 00
Hf Bbls, 14 00	@ 15 00	Coconut, 65 00	@ 65 00
In Kits, 3 00	@ 3 25	Coconut, 65 00	@ 65 00
Ex Mess, 3 00	@ 4 00	Coconut, 65 00	@ 65 00
Pkld Herring, bx 3 00	@ 3 50	Coconut, 65 00	@ 65 00
Boston Smoked, 1 00	@ 1 50	Coconut, 65 00	@ 65 00
LIME, ETC.		Coconut, 65 00	@ 65 00
Lime, Sta Cruz, 2 00	@ 2 25	Coconut, 65 00	@ 65 00
bbl, 2 00	@ 2 25	Coconut, 65 00	@ 65 00
Cement, Rosan, 2 75	@ 3 50	Coconut, 65 00	@ 65 00
do, 2 75	@ 3 50	Coconut, 65 00	@ 65 00
Portland, 4 75	@ 5 50	Coconut, 65 00	@ 65 00

## METALS.

(WHOLESALE.)

THURSDAY M., October 4, 1877.

IRON.		COPPER.	
American Pig, ton, 25 00	@ 30 00	Copper Tinned, 37 00	@ 40 00
Scotch Pig, ton, 25 00	@ 30 00	Cheating, lb, 37 00	@ 40 00
White Pig, ton, 25 00	@ 30 00	Sheeting, Yellow, 21 00	@ 22 00
Oregon Pig, ton, 25 00	@ 30 00	Sheeting, Old Yellow, 10 00	@ 11 00
Refined Bar, 30 00	@ 30 00	Composition Bolls, 24 00	@ 24 00
Horse Shoes, keg, 5 00	@ 6 00	Engish Cast, lb, 14 00	@ 15 00
Rolls, 5 00	@ 6 00	Anderson & Woods, ordinary sizes, 16 00	@ 17 00
Norway, Oval, 24 00	@ 24 00	Flat Bar, 15 00	@ 15 00
Rolls, 24 00	@ 24 00	Plow Steel, 15 00	@ 15 00
STEEL.		Tin Plates, 8 50	@ 9 00
Engish Cast, lb, 14 00	@ 15 00	Banca Tin, 24 00	@ 24 00
Anderson & Woods, ordinary sizes, 16 00	@ 17 00	Australian, 19 00	@ 20 00
Flat Bar, 15 00	@ 15 00	ZINC.	
Plow Steel, 15 00	@ 15 00	By the Cask, 11 00	@ 11 00
Tin Plates, 8 50	@ 9 00	Sheet 73 1/2, 7 to 10, lb, 11 00	@ 11 00
Banca Tin, 24 00	@ 24 00	73 1/2, 11 to 14, 11 00	@ 11 00
Australian, 19 00	@ 20 00	84 1/2, 8 to 10, 12 00	@ 12 00
LUMBER.		84 1/2, 11 to 10, 12 00	@ 12 00
By the Cask, 11 00	@ 11 00	NAILS.	
Sheet 73 1/2, 7 to 10, lb, 11 00	@ 11 00	Assorted sizes, 3 00	@ 3 25
73 1/2, 11 to 14, 11 00	@ 11 00	QUICKSILVER.	
84 1/2, 8 to 10, 12 00	@ 12 00	By the lb, 47 1/2	@ 50 00
84 1/2, 11 to 10, 12 00	@ 12 00	LUMBER.	

## LUMBER.

(WHOLESALE.)

WEDNESDAY M., October 3, 1877.

CARGO PRICES.		REDWOOD.	
Rough M, 14 00	@ 14 00	Rough, 18 00	@ 18 00
Refuse, 14 00	@ 14 00	Fencing, 18 00	@ 18 00
Clear, 24 00	@ 24 00	Flooring and Stp, 28 00	@ 28 00
Clear Refuse, 14 00	@ 14 00	Clear, 24 00	@ 24 00
Rustlo, 27 50	@ 27 50	Clear Refuse, 14 00	@ 14 00
Refuse, 14 00	@ 14 00	2d quality, 25 00	@ 25 00
Surfaced, 24 00	@ 24 00	100 Laths, 3 50	@ 3 50
Refuse, 14 00	@ 14 00	2d quality, 25 00	@ 25 00
Flooring, 25 00	@ 25 00	REDWOOD.	
Refuse, 14 00	@ 14 00	Rough, 18 00	@ 18 00
Beaded Flooring, 25 00	@ 25 00	Refuse, 14 00	@ 14 00
Refuse, 14 00	@ 14 00	Pickets, 18 00	@ 18 00
Half-inch Sliding, 20 00	@ 20 00	Pointed, 20 00	@ 20 00
Refuse, 14 00	@ 14 00	Sliding, 20 00	@ 20 00
Half-inch Battens, 18 00	@ 18 00	Flooring, 25 00	@ 25 00
Picket, Rough, 12 00	@ 12 00	Refuse, 14 00	@ 14 00
Picket, Pointed, 12 00	@ 12 00	Half-inch Surfaced, 22 50	@ 22 50
Fancy, Pointed, 18 00	@ 18 00	Refuse, 14 00	@ 14 00
Shingles, 2 00	@ 2 25	QUICKSILVER.	

## Gold, Legal Tenders, Exchange, Etc.

(Corrected Weekly by SUTRO &amp; CO.)

SAN FRANCISCO, October 3, P. M.

LEGAL TENDERS IN S. F., 11 A. M., 97½¢.	SILVER, 44½¢
GOLD IN NEW YORK, 103½¢.	
GOLD BARS, 900. SILVER BARS, 9@15¢ cent. dis.	
EXCHANGE ON NEW YORK, 1/4% on London bankers, 49½¢.	
Commercial, 49½¢; Paris, 1/2 francs 3/4 dollar; Mexican dollars, 93¢.	
LONDON CONSOLS, 95½¢; Bonds, 107½¢.	
QUICKSILVER IN S. F., by the flask, 43@45¢.	

## To Mining Secretaries.

An amendment to Section 336 of the California Code, taking effect July 1st, 1874, provides that in addition to the regular publication, daily or weekly, of the assessment and sale notices as heretofore,

## PERSONAL NOTICE

Must be served as provided in the following quotation from the law:

"The notice must be personally served upon each stockholder, or in lieu of personal service, must be sent through the mail, addressed to each stockholder at his place of residence, if known, and if not known, at the place where he principal office of the Corporation is situated."

The above refers to the ASSESSMENT NOTICE only. Advertisers in the MINING AND SCIENTIFIC PRESS will be furnished with copies of assessment notices printed on slips suitable for serving personal notice under this act at short notice.

DEWEY &amp; CO., Publishers.

## Testing and Working Silver Ores.

The above is the title of an illustrated work of 114 pages, for miners and prospectors, by Chas. H. Aaron, which has just been issued by Dewey & Co. Mr. Aaron has managed to give many useful hints and suggestions, free from all technicalities, and in such a style as to be easily comprehended. It is written for the miner, with no chemical symbols or metallurgical technicalities to confuse those who are not chemists or metallurgists. The following summary of the contents of the work will give an idea of its scope.

Under the heading of the first chapter, "Testing Ores for Silver," we find paragraphs on ore formation, test for silver, with heat and water, acid or blow pipe. In speaking of testing for a process, the extent and richness of ore is considered, smelting ores, selecting and working same, appliances for testing, roasting, etc. Under the head of "Working Ores" the author describes Aaron's process has something to say of superheated steam, preparation of dichloride of copper and protochloride of copper, use of copper and iron, quantity of chemicals, carbonate of lime, chloride ores, amalgam, Patchen's process, etc. He also describes the methods of working roasted ore, treatment of base metals, stirring, heat of furnace, want of sulphur, etc. Under the head of "Leaching Processes" are the titles, Smelting, Mexican process, Chilean process, Kirochich's process, etc. Under "Pulverizing Machines" are described the arastra and its construction and operation, stamp batteries, screens, Crocker's trip-hammer battery, Paul's pulverizing barrel, Kendall's battery, Noice's pulverizer, a cheap rock breaker, etc.

In speaking of amalgamators the author describes a cheap amalgamator, grinding the ore, directions for making a barrel, preventing mechanical wear, use of quicksilver, copper in bars, F. E. berg barrel, cheap barrel trough, barrel on rollers, Aaron's amalgamator, separator and, etc.

He describes an improvised retort, roasting furnace, furnace tools and furnaces building. Among the miscellaneous mention may be found Aaron's leaching apparatus, with two or three different arrangements, a small mill, sampling tallies and setting tanks, dichloride of copper, etc. Mr. Aaron is a practical miner, of long working experience on this coast.

The book is a serviceable one for miners and prospectors' use. Price, post free, \$2.00. Address Dewey & Co., MINING AND SCIENTIFIC PRESS, 202 Sansome Street, San Francisco.



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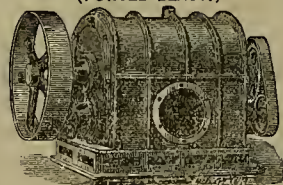
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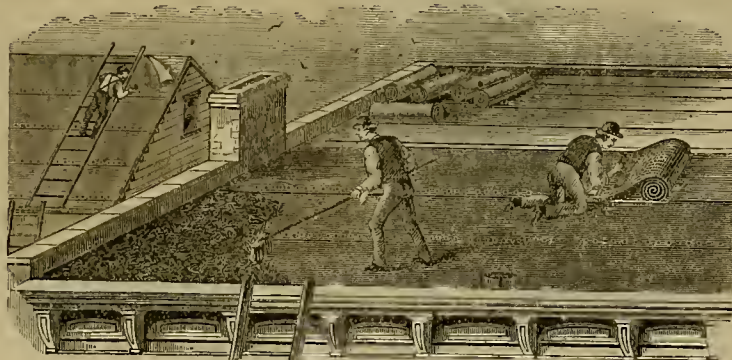
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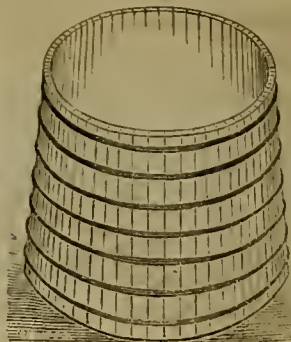
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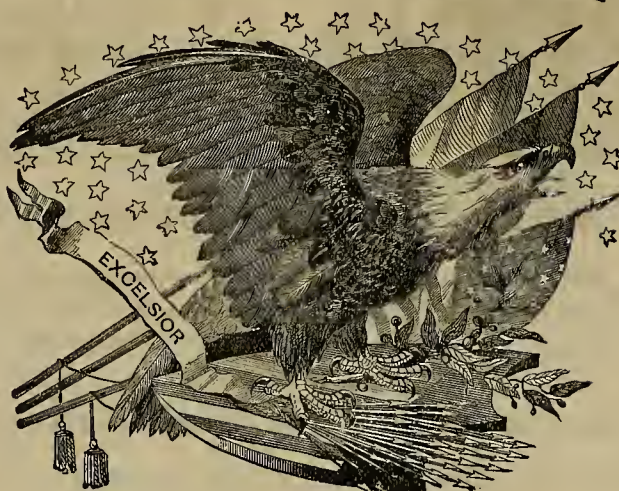
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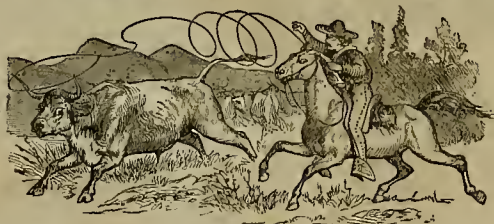
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An Illustrated Journal of Mining, Popular Science and General News.

BY DEWEY & CO.,  
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SAN FRANCISCO, SATURDAY, OCTOBER 13, 1877.

VOLUME XXXV.  
Number 15.

## Straw and Corn Cutting Machines.

The advanced state of agriculture has produced a demand for improved machinery and appliances, by which the preparation of feed and the cost of raising stock can be reduced to a more economical system. Hence it has been the study of numerous inventors how to construct a machine for cutting hay, straw, etc., in a first-class manner, and in combination will reduce even corn stalks and the coarse material usually found in feed, fine enough for all kinds of stock to eat, requiring that class of feed, and that the machine will not destroy the tender parts while reducing the coarser portion to a proper degree of fineness. That the machine will not be cumbersome and too complicated in construction, as well as to be too difficult to keep in running order, and too laborious to operate; to perform these several operations at once, also that it will meet the wants of all requiring that class of machinery, such as paper manufacturers, collar makers, egg packers, stock breeders, dairymen, farmers, liverymen, and numerous others.

The machines illustrated on this page, manufactured by J. Dick & Bros., Canton, Ohio, embrace the foregoing requirements in practical form:

Fig. 1 is a fair representation of the No. 1 Dick's superior hay, straw and cornstalk cutter and splitter, arranged for horse or steam power. It has a pulley on the main shaft to receive a belt. It will cut from 3,000 to 5,000 lbs. per hour, according to the material and length of cut. It has two sets of feed rolls and two boxes. It is so arranged as to cut on both sides of the main shaft; by this device the knives cut from two boxes instead of one. This machine cuts 19 inches wide and three inches thick, with 12 inches long. The cut can be changed to eight different lengths, between one-quarter and one-eighth inches. The shear plates are made adjustable, and are independent of the working parts. In case of wear they can be readily taken out and ground and are easily replaced and adjusted. All the working parts are encased, to prevent straw, etc., from getting in contact with the machinery, also to guard against accident. The encasing is all independent of the frame of the machine and can be readily removed if desired. This machine is built with two or three knives as the purchaser may wish.

Fig. 2 gives a perspective view of the machinery and the arrangement of folding the feed boxes over the machine. Each of the feed rollers are set, driven independent of each other by endless space chains, so as to give them perfect freedom in adjusting themselves to the irregular thickness of material passing between them. In the cutting of corn stalk, especially with the ear on, it is difficult to feed even thickness, as it often happens that on one end of the feed roller several corn stalks and ears of corn will pass between them, at the same time on the other end of the roller will be comparatively nothing. By this device of driving the feed rolls, the machine cannot be injured by over feeding. The tension springs that give pressure to the feed rollers are made of tempered steel and are mounted underneath the feed roller, pressing on the center of cross-bars. These cross-bars are hinged to iron rods which are connected with the bearings on each end of the feed roller; by this arrangement the ever-changing position of the rolls is not interfered with by the tension springs. The feed gears are made interchangeable and can be changed *vice versa*. By this device a great many different lengths of cuts can be made with but few wheels. All the working parts are made to take up in case of wear. The feed gears are provided with a new plan for keeping them lubricated; the oil is applied through the center of the bearings, and cannot go to waste unless passing through the bearings first and performing its duty.

Figure 3 gives a view of the fly wheel as constructed for all the machines, hand and power, of different sizes. This wheel is mounted on the main shaft; on this shaft is mounted the driving pulley and the bevel pinion that gives motion to the feed gears. On the fly wheel is placed the whole cutting apparatus—

the knives, two or three in number, as the case may be, is supported on adjustable supports. These supports are provided with inclines or clutches and are made to revolve on similar inclines on the spokes of the fly wheel. By partly revolving these supports the knives can be adjusted to or from the shear plates, as the case may require, and firmly secured in their proper position by two strong bolts passing through each knife, the supports, and the arm of the fly wheel. The knives are straight blades. This form of knife is readily adjusted and easily kept in order.

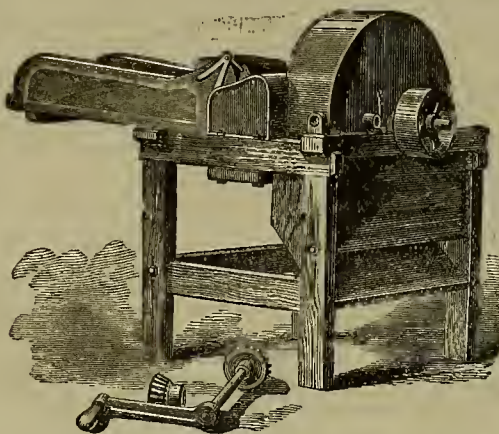


Fig. 1, Dick's Straw and Corn Stalk Cutter and Splitter.

Preceding the cutting knives are a series of steel blades, arranged on curved bars. These blades are set closely to each other so as to cut, split and crush corn stalks, ears of corn, and all coarse material into minute particles. These blades operate at a right angle, or nearly so, with the cutting knives, and are arranged in curved lines from the main shaft. By this device the blades precede each other and will operate easy, and cannot clog up so as to prevent

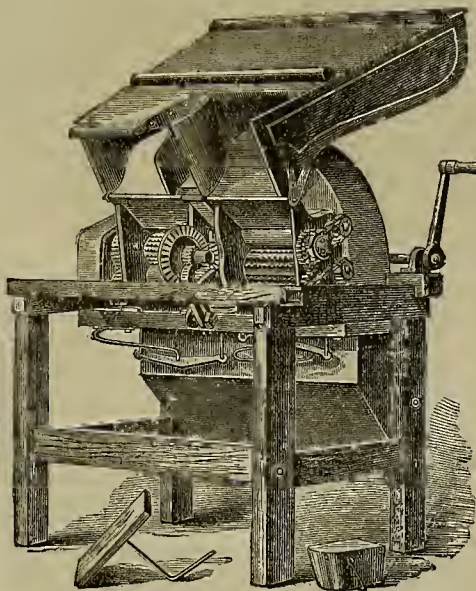


Fig. 2, Perspective View of the Mechanism.

them from performing this work. For cutting hay, straw, etc., these splitter bars are not required and can be readily detached by loosening two bolts in each bar, thus leaving only the cutting knives attached to the fly wheel. The main bearings are filled with babbitt metal in all the machines, and can be readily refilled in case of wear.

The Water Commissioners have decided to recommend the Blue lakes scheme for supplying San Francisco with water.

## New Mining Districts.

At a meeting of miners at Royal City, on the 25th ult., it was unanimously agreed on the vote of the miners to segregate that district from Bristol district, the new district to be called the Jackrabbit mining district. The boundaries of the Jackrabbit mining district to be bounded on the southeast by the Highland mining district, on the northwest by the Last Chance district, on the south by the summit of

the mountain to the valley. This district is in Lincoln county, Nevada, and has lately attracted considerable attention.

Fine Gold Gulch district has been formed at Fine Gold Gulch, 35 miles northeast of Borden, Fresno county. C. E. Strivens has been elected Recorder. The boundaries of the district are as follows: Commencing at John Williams' ranch; thence west to Harbert's mill; thence in a westerly direction to Johnson's ranch;



Fig. 3, The Fly Wheel.

thence to the San Joaquin river; thence up the San Joaquin river, following the meanderings of the stream, ten miles, and from thence northerly to the place of beginning.

THE Los Angeles *Republican* says: Captain Kraszynski, of Andrew station, informs us that on Friday last the well on the Pico district known as "Pico No. 2," struck oil at a depth of 200 feet, and at last accounts was flowing 300 barrels per day.

## The Hayden Surveys.

The work done by the Hayden Geological and Geographical Survey has been probably better appreciated by the people at large than any similar work ever done in the United States. As a general thing the public seems to be opposed to the expenditure of public moneys for things of this kind, for the results attained do not seem to the average mind to be commensurate with the expense. Of course this conclusion is erroneous, as any well-informed person knows. However, in this case, the survey has been, and is, very popular with all classes of people, and the reports have been properly appreciated by all. To scientific men they are of deep interest as the sections of country examined by the survey have been entirely new, and the discoveries important. The publications have been issued in first-class style and are satisfactory in every respect. To show how the work of the survey is appreciated abroad we publish the following extract from a letter from J. Barrande, the eminent paleontologist of Prague, Bohemia, to Professor F. V. Hayden, the chief of the survey:

In 1876 I received of you a series of various publications, for which I beg you to accept my warmest thanks. Among those publications there are two which are especially distinguished by their extent and the accompanying illustrations. One is Mr. Meek's last work on the invertebrates of the cretaceous and the tertiary formations of the upper Missouri; the other is Mr. Cope's work on vertebrates of the cretaceous lands in the West. These two magnificent quarto volumes give the measure of the grand plan which is to immortalize the work of your United States Geological Survey of the Territories.

You have laboriously and successfully conducted that survey over an immense area, and you continue to do it with an equal success in the co-ordination and the publication of the incomparable mass of observed facts. I am happy to have the chance to express to you my congratulations for this double success.

The beauty of the plates and the typographical luxury of your two large quarto volumes honor the artists of your country, and contribute to ennobling the monument erected by you to science. That monument will testify that the supreme legislature of the United States, by exercising a sovereign munificence in the name of a great nation, well understands that a narrow parsimony would be very much out of place and show very little patriotism in regard to securing a national glory. After all, pacific glories of science cost much less than bloody laurels, and secure more desirable sympathies among other nations. Honor to your intelligent legislators! The day will come when they will show you more positively their gratitude.

HALE & NORCROSS.—The total expenses of running the Hale & Norcross works, underground and on the surface, for the month of September was \$16,820.13. There were consumed for running the pumping engine alone 521 cords of wood, or an average of 17½ cords per day; in all 655 cords were consumed. On the 1st instant there were on hand at the works 1,061½ cords of wood. The number of days' labor performed was 1,464½; and the average wages per day was \$4.41½. During the month the pump was stopped 47 hours and 16 minutes, or one hour and 34½ minutes per day. The pump made 299,420 strokes during the month, being an average of 6 97-100 per minute, and hoisted 14,976,000 gallons of water.

The mine owners of Gold Run have concluded to discharge all the Chinese in their employ, and work their mines in future exclusively with white labor at reduced wages. The wages paid miners to be \$35 per month, and furnished with board and sleeping apartments. It is said Mr. Stone, Superintendent of one of the Gold Run mines, is now working the men he employs on this lay-out, and the miners working the Hayward mines at You Bet are hired on the same terms.



## CORRESPONDENCE.

It is the desire of the editors of this journal to be liberal toward all correspondents, and therefore statements and opinions are frequently published, on the authority of the writers, for which we do not assume responsibility.

### Notes from the Mountains.

EDITORS PRESS:—The country for 14 miles from Stockton, on the Copperopolis road, is, I think, a portion of the best in the State. The soil is adobe, and, judging from the crops I have seen, it must be rich. But, after striking the sand plains the only product of the soil seems to be gravel stones. At Telegraph City, where there is a population of one family, we enter the mining region. The gulches which used to yield the "dust" and echo in response to the gold-seeker's clamor are now still, and the sound of the pick, shovel and pan are heard no more. A few miles more brought us to Thos. McCarty's place where we stopped for the night. Mr. McCarty is one of the old pioneers, and one of the first locators of copper mines in this section. In the morning we had the pleasure of riding to Copperopolis (four miles) behind a five-horse team.

The copper mines of this place once gave employment to about 800 men. But now, as the strangers wander about the place the stillness seems greater than that of a New England Sabbath. The coming of the daily stage, between Milton and Sonora, caused the usual excitement, and after horses had been changed, and the Union hotel table unloaded, we took our seat with the driver, Mr. Shine, on the four-horse stage for Sonora, and away we started at 12:45 P. M. That is what I enjoy, a ride up the mountains being entertained by a good driver.

Eight miles from Copperopolis we came to the Stanislaus river, which we crossed in a ferry-boat, and here we saw men engaged in river mining. Eight miles more we came to Turtle Town, where several quartz mines are located, and here also the stage horses are changed; we are in the mining country now, and as we come in sight of the old placer diggings of Springfield and Columbia they present a peculiar appearance. The earth has all been washed away from the great, gray boulders, and they look as if they were guarding some great enterprise.

Thousands of people have searched and obtained gold in greater or less quantity, but now, as we ride through on the stage, while the shades of evening fall, we only see the works of a few miners who yet linger about the places which once knew a multitude. At 5:30 we arrive in Columbia, where this is written.

I have also had the pleasure of visiting three of the quartz mines of Tuolumne county. Soulsbyville I came to first, and as I passed through the camp I noticed three new houses going up, also a new hall. The mine has been under the supervision of Mr. John Leechman for about 19 months, during which time the mill has not been idle a day for want of quartz. The mill formerly ran ten stamps, but recently five stamps have been added. Mr. Leechman is a very pleasant man, and it is through his energy and ability that this mine has become the leading mine of this county, as well as one of the first in the State.

The Ohio mine was the next. This mine is superintended by Mr. H. A. Raudall, but he being absent we were shown around by Mr. James Johnson. This mine is being opened, and if it had not been for the accident by fire of several weeks since, rock would have been taken out before this. Five weeks after the fire everything was in working order. Everything had to be rebuilt except the wheel and the lagging of the shaft.

From this mine we took the Indian trail to Confidence. This mine at present is quiet, although the pumps are kept going night and day, so the mine will not fill with water. We understand this mine was paying when they ceased working. The mill is in good repair, drives 40 stamps, and is considered to be one of the best mills in the State. Mr. Wm. Symons, the Superintendent, gave us a cheery welcome, and seems to be confident that are long the Confidence mine will make things lively in that camp again. I hope so, for not only are the miners benefited, but the mountain ranchmen also reap a golden harvest when the mines are running. I notice with pleasure that the MINING AND SCIENTIFIC PRESS is looked upon as authority on mining matters in the mountains.

R. A. EASTON.

### Calaveras County Mines.

EDITORS PRESS:—I hope the following items from our camp will prove acceptable: The San Bruno is owned by Garland, Kellogg & Harris. Shaft, 480 feet deep; 31 men employed; about 200 tons ore on dump; taking out about 12 tons per day. The ore from this mine works about \$80 per ton. John L. Hoey, Esq., Superintendent.

Moute Cristo is owned by same parties as above; worked by tunnel, which is now in 355 feet; six men employed, and are taking out ore that shows large quantities of free gold. J. L. Hoey, Superintendent.

Good Hope belongs to the same company,

having the same Superintendent. Will commence operations on Monday next. Four men employed in getting engines and pumps in working order.

The Banner mine, formerly the Grasshopper, has recently become the property of Col. Johnson, of the Tiger mine. The Banner has a record of taking out \$18,000 in sinking 80 feet. It has been lying idle for the past six months, but has started up with a new engine and eight-inch Cornish pumps. About 20 men are employed. Col. Johnson personally superintends the works.

The Holmes mine employs eight men and is being worked by tunnel—contract work.

The Dom Pedro is owned by Peter Cass; vein is about seven feet in width; six men employed; has just finished crushing about 100 tons of ore, which paid \$13 per ton. Peter Cass is the Superintendent. The mine is a new discovery, and is only down about 60 feet. The ore taken from the mine to-day shows free gold.

The "Harryhausen" mine is a new discovery, and is only down about eight feet, but the prospects from it are very remarkable, in fact, fabulous; one bucket of rock prospected over \$40. This discovery has created a great deal of excitement in the camp. There are several other mines in this district, but of them I will write in my next.

### Garland's Mill.

This is one of the finest mills in the State, and has all the modern improvements, including Cochran's self-feeders. The mill is owned by the Garland & Kellogg Co. Harrison Longley, Esq., has charge of this portion of the company's property, and visitors to the camp are always cordially received and shown through the mill by him. The mill is now engaged in crushing ore from the Woodpecker mine.

### Mosquito Gulch.

Lies about 10 miles west of Mokelumne Hill, on the West Point road, and at the present time is as lively a camp as any in the State. It consists of about 40 buildings of various sizes, from an 8x10 miner's cabin to a three-story hotel. Longley's hotel is adjoining Garland's mill, and is run in first-class style by H. Longley, Esq.

J. L. Hoey, Esq., Superintendent of Garland's and Kellogg's mines, is also proprietor of the only store and saloon the camp contains. He is also Postmaster and Wells-Fargo's agent, also stage agent. He is ably assisted by Col. Sam Tiffeld.

Johnny Steel, the *par excellence* of the camp, is carpenter, wagon builder, etc. Johnny can make anything from a hair pin to a gold watch.

The Briggs house is kept by Wallace Briggs, and is the "bon ton" house of the burg.

The Banner hotel, last, though not least, is kept by that old Rincon hotelman, Dave Lampson, and is the Palace hotel of Mosquito. Mrs. Lampson personally superintends the interior departments and makes her guests comfortable.

ONALED.

Mosquito Gulch, Calaveras Co., October 2d.

### Mining in Victoria.

The *London Mining Journal* has been favored by Mr. Thomas Couchman, Secretary for mines and Chief Inspector, with the Mineral Statistics and Reports for 1876. The Minister of Mines—Mr. William McLellan—remarks that the non-discovery of new areas of auriferous drift during the past year, and the want of water for sluicing operations, caused by the extreme dryness of the season, have operated prejudicially upon the yield of alluvial gold, but it is gratifying to find that quartz obtained from deeper levels of the vein mines continues to give satisfactory yields. This should act as an incentive to the further exploration of those neglected mines which gave satisfactory returns of gold at shallow levels. The Department is again indebted to mine owners, mine managers, managers of banks, and others for assistance courteously given to its officers for granting them access to their books, and otherwise furnishing information required for the compilation of the returns. Over 1,000,000 tons of quartz are included in the returns this year—the exact quantity is 1,011,808 tons 4 cwt.—which is the largest quantity of quartz yet returned in any year.

The reluctance displayed by mine-owners in years past to the publication of the results of their crushing operations either now no longer exists, or exists but in isolated cases. The total yield of gold in the returns of quartz, quartz tailings, and pyrites crushed and treated now approaches so nearly to the estimated amount of gold raised from quartz reefs as to afford very satisfactory proof of the accuracy of the several estimates, and there can be but little doubt that they are very nearly correct. There are no such means of checking the estimated yield of alluvial gold, in consequence of so few of the mine-owners in this branch of mining keeping records of the amount of wash-dirt and cement passed through the machines. The estimates for 1876 show that the yield of gold was less by 100,000 ozs. than the quantity raised in the preceding year. It appears, moreover, that during the past nine years the quantity of gold obtained from the alluvial deposits has fallen off annually, and that the yield of last year is less by two-thirds than the yield in 1868. The general decrease is due to the gradual and inevitable exhaustion of the gold in the drifts of the first discovered gold fields, and to the non-discovery of new mining areas of sufficient importance to compensate for the reduced yields of the older fields. The yearly yield of gold from quartz mines has fluctuated

between 585,575 ozs., the minimum in 1870, and 691,826 ozs., the maximum in 1872. Although the average yield of gold per ton was less in 1876 than during the preceding five years, the statistics show that, taking the past 15 years, it is about equal to the mean for that period. The quantity of pyrites and blanketings operated on during the past year is a little less than the quantity treated during 1875; the average yield of gold per ton is about the same. Over 5,000 tons were treated in the Sandhurst district alone. Ararat is the only mining district not represented in this return.

The mining district giving the highest average return of gold per ton is Gippsland, and the next is Ararat, but the quantity of quartz crushed in these districts as compared with the Sandhurst and Ballarat districts is relatively small. The quantity of wash-dirt panned or sluiced during the year 1876, according to the returns made by certain companies and individual miners, was 574,164 tons 2 cwt., the yield of gold from which was 27,116 ozs. 13 dwts. 22 grs., or an average of 22.67 grs. per ton. Information has been obtained respecting the crushing of 35,938 tons 7 cwt. of cement, which yielded 8,171 ozs. 15 dwts. 4 grs. of gold, or an average of 4 dwts. 13.14 grs. per ton. The number of persons employed on Dec. 31st, 1876, was—alluvial miners, 26,558; quartz miners, 14,452; together, 41,010. The number of alluvial miners is still decreasing. The number now employed is about 10,000 less than in the year 1872; since the same year the number of miners employed in quartz mining also has diminished by over 2,000, but the decrease in both classes of mining in 1876 as compared with 1875 is only 707. In 1872 there were 14,158 Chinese engaged in mining pursuits, whilst in 1876 there were but 11,167. The Chinese miners have decreased in number annually since the year 1861, when they amounted to 24,544. Although the Chinese miners do not in this colony become absorbed in other industrial pursuits, like European miners, it is a remarkable coincidence their decrease in number is almost exactly in the same relative proportion. Dividing the value of the gold exported and received into the Mint amongst the mean number of miners employed in the year 1876 the average is £89.19s. 7d. per man per annum.

During the past five years the number of steam-engines employed in alluvial mining has decreased by 90, and the number employed in quartz mining has increased by 10. A greater number of steam-engines was employed in quartz mining during the last year than in any preceding year. The estimate of the value of the machinery and appliances in use on the several gold fields of the colony for the past five years show: 2,098,574*l.*; 2,131,188*l.*; 2,075,936*l.*; 2,033,629*l.*; and (in 1876) 1,989,500*l.* respectively. The approximate area of auriferous ground over which mining operations extended up to the end of 1876, is 1,134 square miles, and the number of distinct quartz reefs proved to be auriferous is 3,307. The total area occupied as mining claims under the provisions of the by-laws of the several mining boards, and the area held under leases from the Crown, on Dec. 31st, 1876, were—claims, 52,388 acres; under leases, 19,249 acres.

Quartz mining continues to be followed as a remunerative industry year by year at increasingly greater depths, notwithstanding the greater cost of the appliances necessary for working the lodes. One of the shafts at Stawell is 1,290 ft. in depth, and others 1,706 ft., 1,500 ft., 1,262 ft., 1,141 ft., 1,050 ft. At Sandhurst, Clunes, and Ballarat there are also shafts ranging in depth from 800 ft. to 1,158 ft. The quarterly published reports of the mining surveyors show that about 11,500 tons of quartz obtained at Stawell, at depths varying from 430 to 1,060 ft. from the surface, yielded 1 oz. 3 dwts. to 5 ozs. 14 dwts. per ton; that 5,890 tons of quartz obtained at Sandhurst, at depths varying from 500 feet to 1,000 feet, yielded from 1 oz. 14 dwts. to very nearly 2 ozs. per ton; and that quartz obtained from the deep mines at Blackwood, St. Arnaud, Tarrangower, and Stringer's creek has given from 13 dwts. to 3 ozs. 15 dwts. of gold to the ton.

With regard to metals and minerals other than gold produced in the colony the statistics also afford much interesting information. Silver—There were 3,388 tons 10 cwt. of argenteiferous ores raised during the year, and 26,356 ozs. 7 dwts. 19 grs. of silver were obtained, of which 25,839 ozs. 16 dwts. 7 grs. were parted from gold smelted at the Mint. Tin—The exports of tin during the year were 34 tons 9 cwt. Copper—There were 37 tons of copper ore raised during the year. Antimony—There were raised during the year 2,529 tons 5 cwt. 2 grs. of antimony ores, and 606 tons 19 cwt. of antimony ore, 474 tons 2 cwt. of antimony regulus, and 254 tons 4 cwt. of crude antimony were exported. Lead—The quantity of lead ore raised during the year was 17 tons 6 cwt. Iron—Of iron ore 5 tons were raised. Coal—There were 1,095 tons of coal raised during the year. Lignite—The quantity of lignite raised was 315 tons 6 cwt. Flax—There were 1,735 tons 1 cwt. 3 grs. of flagging quarried. Full information relative to the exploration of mines where metals and minerals other than gold were raised is given in the report, and there are many valuable remarks with regard to the metalliferous minerals.

With regard to the number of casualties which occurred in connection with mining operations during the period reported on, the report of the Chief Inspector shows that during 1876 there were 209 accidents in the colony, as compared with 275 in 1875, and 296 in 1874.

The number of miners has decreased each year, but a much greater diminution is shown in the number of accidents. In the year 1874 the mean number of miners employed was 46,512, and the number of accidents 296; 90 persons were killed, and the total number of killed and injured amounted to 335. In 1875, 42,058 miners were employed. There were 275 accidents, 83 persons being killed, while the total number of killed and injured amounted to 300. In 1876 there were 41,531 miners employed, and 209 accidents; 55 persons were killed, and the total number of killed and injured amounted to 225. In alluvial mining there were during the past year 11 fewer men killed and 20 fewer injured than in 1875, and 7 fewer killed and 22 fewer injured than in 1874; in quartz mining there were 17 fewer killed and 27 fewer injured than in 1875, and 28 fewer killed and 53 fewer injured than in 1874; 31 of the fatal accidents occurred to men engaged in alluvial mining, and 24 to men employed in quartz mining; 12 deaths occurred from accidents on the surface, and 43 below the surface; 42 of the killed were Europeans and 13 were Chinamen. More than one-half of the killed were married men, who left 87 children. The reduction in the number of accidents is attributed to the exercise of greater precaution in the working of mines since the passing of the Regulation of Mines Statute in 1873.

The Chief Inspector is well justified in congratulating himself upon the improvement shown. Although the number of miners employed in 1876, as compared with the preceding year, was reduced only 2.5 per cent., the reduction in the number of killed amounted to 33.7 per cent., and in the number of injured to 21.6 per cent. The deaths were 1.15 per thousand of the mean number of alluvial miners employed during the year, and of quartz miners 1.52 per thousand. In other words, one death occurred in every 869 miners engaged in alluvial mining, and one in every 608 men engaged in quartz mining. The average death rate per thousand of both classes of miners was 1.32 per thousand, or one death to every 755 miners. This is not so high a proportion of fatal casualties as that shown in the latest return relating to British metalliferous and coal mines, so that the Victorians have good reason to be thankful, and encouragement to endeavor to secure equal safety in future.

### Shipments of Gold Dust from Fresno.

Through the courtesy of Mr. Louis Einstein, and by permission of Wells, Fargo & Co., we have been enabled to glean some statistics relative to the shipments of gold dust from Fresno since the first of last January. We find that in 51 separate shipments, averaging \$200 each package, \$10,101 have been sent below through the Fresno office alone. Besides this, large amounts have been sent marked as sealed packages of coin, and some have been carried out of the county both by whites and Chinese. This, in reality, represents only the gold dust gathered by the Chinese on the San Joaquin river and in various small gulches, and is not an estimate of the gold product of the county. These shipments have been almost exclusively by Chinese, and have come mainly from the old mining camp and county seat, Millerton. Recent discoveries and extensive preparations for working some old claims by white men, give promise of increased shipments next season. Besides several quartz mines are opened or being developed which promises handsome returns. Treasurer Thorn's mine, a few miles south of Big Dry creek, which formerly yielded \$16,000 a year with an arastra, but which has been idle for some time, will probably be reopened during the coming year. In the opinion of some whose judgment should be good, the Jensen mine on Dry creek, is a bonanza in itself, and some others in that vicinity need only a little capital to work them profitably. The Confidence mine, near Fresno Flats, and also a new discovery in that vicinity show some of the finest ore we have ever seen. Recent discoveries in the extreme upper King's river country indicate valuable deposits of gold, silver and copper. It is quite certain that the mining resources of this county are considerable; and it is to be hoped that white men's money and white labor will develop them, and thus allow the county to reap its legitimate benefit.—*Republican*.

RESTING SPRINGS.—A correspondent of the *Colton Semi-Tropic*, writing from Resting Springs district, San Bernardino county, says: The mining outlook for this county is brighter at present than it has been in several years. The Resting Springs mines are proving to be, in every way, a decided success, and are constantly improving in richness and general appearance. There is no longer any doubt of their proving a permanent and profitable investment for the owners. We learn from a private letter from O. G. Leach that, while out walking, a few days since, with a gentleman named Cunningham, in the vicinity of Resting Springs, they discovered one of the richest mines in the district. Mr. Leach says they intend to commence work on it immediately, as they have an excellent showing of high grade ore that will pay to ship to San Francisco. Mr. Leach is good authority on such matters, having spent the greater portion of his life in mining and milling, and is at present engaged in assaying for the Resting Springs mining company. We also learn from miners from the Ivanpah mines that the mines never looked better than at present, and, under judicious management, they would pay good dividends.



## MECHANICAL PROGRESS.

## Marine Steam Boilers.

The building of marine steam boilers is a question of interest to mechanics on this coast. We notice that at the last meeting of the British Society of Naval Architects, there were several papers presented on the subject. Mr. Haswell, in treating the subject in detail, submitted the following rules for the proportions and construction of a marine steam boiler with multifold tubular return: Construction.—For a combustion of 16 pounds of bituminous coal per hour, with a depth upon the grates not exceeding nine inches, heating surface 36 times the area of the grates and with fresh water. (When salt water is used one-twelfth is to be added to the surface). Volume of water from and at  $212^{\circ} 10^{\circ} C + 25 = V$  and by inversion  $\frac{V-25}{10} = C$ ,  $C$  representing the coal in pounds per square foot of grate per hour, and  $V$  the volume of water evaporated in pounds. For a like combustion of coal, and heating surface 50 times the area of the grate.— $11.2 C + 25 = V$  and  $\frac{V-25}{11.2} = C$ . For a combustion of 30 pounds of bituminous coal per hour, with a depth upon the grates of 12 inches, heating surface 36 times the area of the grate and with fresh water.—Volume of water from and at  $212^{\circ} 9.8 C + 25 = V$  and  $\frac{V-25}{9.8} = C$ . For a like combustion of coal, and heating surface 50 times the area of the grate.— $10.9 C + 25 = V$  and  $\frac{V-25}{10.9} = C$ . Mr. Haswell gave some practical suggestions as to the construction of marine boilers, and said, in conclusion, that for use in salt water the thickness of plates and the diameter and area of bolts and stays should be increased one-sixth. Wrought-iron bolts and stays are reduced in strength 25% by cutting the thread of bolts, 20% by welding and 18% by exposure to sudden strain. The mean tensile resistance of boiler plates is 55,000 pounds per square inch, and with the fiber it is from 8% to 10% greater than across it. Rivet iron at a temperature of  $60^{\circ}$  should have a tensile resistance of 60,000 pounds per square inch.

## Strength of Boilers.

Mr. J. Milton, Surveyor to Lloyd's Registry, referred to the effect of the introduction of the compound engine in reducing the consumption of coal, stating that this consumption might be still materially lessened. Higher pressure would accomplish this, and how safely to obtain higher pressure is an important practical question. Not less important than the actual factor of safety is the question how it should be measured. After stating that certain parts of boilers are subject to greater strain than others and therefore liable to give at a lower pressure, Mr. Milton referred to several particulars in which many of the marine boilers of the present day suffered from defective construction, which made their actual margin of safety much less than their supposed one. Yet such boilers run safely. Boilers are subject to certain strains arising from the unequal expansion of their different parts. If ordinary wrought-iron plates are subjected to stress, they alter in length a certain amount according to the quality of the iron, the more ductile irons altering more for the same amount of stress. Difference of temperature has an important influence. The only way to strengthen furnaces from excessive strains is either to prevent the difference of temperature or else to allow the crown freedom to expand. The better way is to flange the furnace crown on to the tube plate with a large radius. The shell of the boiler is subject frequently to variations of temperature in its several parts, thus inducing unequal pressure. To reduce strains thus occasioned, a soft ductile iron should be used, allowing a given stretch with less stress than a hard plate, and the strength of the circumferential seams should be made as nearly as possible equal to the solid plate, or provision should be made for such a circulation of the water in the boiler as will prevent the difference of temperature from coming on the material. Landore steel promises to be the best material for use in marine boilers, in respect both of strength and ductility. With respect to the circulation of the water several plans have been adopted. Of two plans which give equal results, that which is provided for in the design of the boiler must have preference over one requiring any special attention on the part of the engineer.

## American Skill in Silver Working.

It is quite a gratifying thing to know that Americans are not deficient in that skill in metal working which approaches the borders of the fine arts. It is said in the *Silversmith and Watchmaker* that Europe was quite surprised to see, at the Centennial, that American workmen were skillful enough to execute a piece of work like the Bryant vase, which we described last year in the MINING AND SCIENTIFIC PRESS. It will doubtless be interesting to read of some of the processes by which this vase was produced. We quote from a writer in the *Silversmith*: "As far as handcraft is concerned the 'Bryant vase' showed that hammered or repousse

work was well known to our artisans. European work of the best class, not excepting the celebrated Milton shield, wrought by Morel La Denil, or the finest attempt of Vecht or Attarge is inferior to this, for most of these were on flat surfaces, while the triumphant American piece was executed in relief on a vase, every part of which was hammered out. This, perhaps, might need a few words of explanation, yet every one will understand that it is evidently much easier to hammer out ornament on a plate of metal than on a vase, the inside of which is more difficult to reach with a hammer. The method the Tiffany's used in producing the vase is, nevertheless, simple in theory, and I will endeavor to explain it. An ingot of silver of sufficient size is hammered out into a round, flat piece of even thickness, which will be beaten into the shape of the body of the vase. The rim of this silver disk is first hammered up, giving the piece the appearance of a deep saucer; on the edges of this saucer parallel flutes are next struck with a quilling hammer. The object of this is to facilitate the difficult operation of 'drawing up' the sides. This is produced by hammering up the silver by a series of blows, striking the metal, not on an anvil, but rather over the edge of a peculiar-shaped anvil called a stake iron, the hammer falling on the silver a little higher than the spot that rests on the anvil. The workman continues turning the piece, which he holds with one hand while he strikes with the other, hammering the bottom of the saucer with a specially shaped hammer called a 'dipping up' hammer. The silver is also worked out or 'lowered.' By judiciously combining the two processes of drawing up the sides and lowering the bottom, the shape of the lower part of the vase is obtained. The malleability of metal allows the craftsman, by the use of his hammer, to draw in the metal at the top, thereby completing the shape. Great skill is required to keep the thickness of the silver even during the operation. Sometimes hammers made of buffalo horn are used in particular parts of the process.

"I will now show how the raised ornament is produced: The next operation is that of 'snarling.' This euphonic term signifies the process by which the requisite amount of silver bumps will be produced on the surface of the metal to allow the ornament to be worked up in relief. In many cases, for instance, when the neck of a coffee-pot of Persian shape is hardly one inch in diameter, it seems at first sight, impossible that a hammer could be introduced to beat out the ornament. This work is done with a snarling-iron. Suppose a piece of iron 18 or 20 inches long, terminated at one end by a short elbow bearing a small, rounded knob, and at the other by a flat piece, also bent at right angles with the rod, which can be securely fastened to a vise; this iron is introduced into the body of the vase, on the outer surface of which the ornament to be produced has been sketched; the vase is held in a horizontal position; the rounded knob brought in contact with the inner surface; an apprentice, armed with a heavy hammer, strikes the part of the tool held in the vise, and the concussion of the blow, carried along the snarling iron, causes a bump to be raised on the outer surface of the silver; soon a continuous series of bumps is produced on the vase which sketch out the relief of the ornament, roughly, it is true, but very much in the same way as a modeler first disposes lumps of modeling-wax on a pattern he has to ornament with flowers or figures. When the snarling is done, that is, when the entire relief of the ornament has been beaten out with the snarling iron, the work of the chaser begins. Into the vase is poured a hot cement, consisting principally of pitch; when this cools the vase is filled with a solid, yet slightly elastic body, which yields to the blows that may be given to the outer surface of the metal. The chaser's skill consists in finishing the outside of the piece, denting it with blows from small punches and flat tools struck with a light hammer. He pushes back the silver where the snarling iron has pushed it out too far, and soon produces the delicate ornaments people so much admire on fine repousse work."

A LUBRICATING PLOW.—We read in *Mines, Metals, Arts, etc.*, of an invention which is said to be practical, but which we should prefer to see at work before investing therein. It "consists in the combination with the mold-board of a plow, of a fountain attachment, introduced between the mold-board and share; also lubrication from the colter on its sides, and to the plow point, through which oil, water, or other liquids may be supplied, whereby the face of the mold-board is caused to pass smoothly and easily through the soil, without the sticking and adhering of the soil, as always happens without their device. The fountain consists of perforations, or thin slit openings, between the mold-board and the share, which are connected by proper tubes with a tank of oil (or water, which is just as good) to a reservoir, which may be attached to the handles or beam, or preferably to a tank or cask on the riding wheels of the plow, whence the lubricating liquid is supplied to the tubes and oozes or passes out through the slits into the colter, share and mold-board, and permitting not only sticky or waxy land to be turned over and broken up, but as well applies to the hard clay soils of any country, in the time for summer and fall plowing." It is said further that "the reservoir may contain 50 gallons of water, or a day's supply in plowing one and a half or two acres." But what do the horses think of the draft of a plow weighted down by 400 pounds of water?

## SCIENTIFIC PROGRESS.

## Study of Earth Worms.

This most curious case of the intimate relations of animals to plants, and of both to the processes of sub-aerial change taking place on the earth's surface, has recently been worked out in great detail by Von Hensen, who, strange to say, does not seem to have heard of Darwin's labors, which he confirms and supplements. He states that the adult worms come to the surface at night, and, with their tails in the mouths of their burrows, survey the country round and collect food in the shape of leaves and twigs. These are heaped up around the entrance, the leaves being rolled up separately and partly drawn into the tube, where they soon become macerated and partially decomposed, so as to form such savory meat as the worm's soul loveth.

Von Hensen's observations were conducted in a garden with a layer of mold nine inches deep and a subsoil of yellow diluvial sand. The worm-tubes were not easily traced in the mold, but were perfectly clear in the sand, running vertically downward to a depth of from three to six feet. The tubes were often found to be lined with stones about the size of a pin's head, brought from the surface, and fruit kernels were also found in them. But the point of chief importance is that the walls of the burrows were found to be beset with little black masses of a characteristic shape—the excrements of the worms. Besides these fresh inhabited tubes, others were found in which the cavity was filled with black earth, the black color being diffused into the surrounding sand, and these again passed insensibly into mere black stripes—veins of mold running in the sandy subsoil.

In about half of the uninhabited tubes were found the roots of plants growing on the surface. These followed exactly the direction of the tubes and gave off fine root-hairs through the black walls of the latter. From an extended series of observations, Von Hensen states that the roots of annuals can only penetrate into the subsoil through channels opened out to them by earth worms; and he observes that this penetration must be of service to the plant, as the subsoil retains moisture longer than the surface layer of mold.

The contents of the intestines and the excretions of worms show a great similarity in microscopical and chemical characters to "vegetable mold" (*Blattererde*), formed by mixing together rotting leaves and sand and leaving them for about two years, after which time the leaves are found to have undergone complete decomposition, a very few shriveled cells being discoverable among sand grains and brown organic molecules.

To ascertain the precise part taken by the earth worm in the production of this vegetable mold, Von Hensen placed two worms in a glass vessel filled with sand, on the surface of which was spread a layer of fallen leaves. The worms set to work at once, and after about six weeks the surface of the sand was found to be covered with a layer of mold nearly half an inch deep, while many leaves had been carried to a depth of three inches. Worm-tubes ran in all directions through the sand. Some were quite fresh, others had a wall of mold an eighth of an inch thick, others again were completely filled with mold. In short, the soil of the vessel was already perfectly well prepared for the growth of plants.

A single worm weighs about 46 grains, and produces, in 24 hours, nearly eight grains of excrementitious matter. There are, on an average, about 34,000 worms to an acre of ground, the combined weight of which is over 220 pounds, and which together pass through their bodies and reduce to a fine state of division about 37 pounds of mold in 24 hours. Besides this they produce a uniform distribution of the mold, open up passages in the subsoil for roots and render the subsoil fertile. They thus perform for the agriculturists an office which is not only valuable and extensive, but quite inimitable.

INFLUENCE OF WINE BOTTLES ON WINE.—It has recently been determined in France that wine may be injured through the glass of the bottles in which it is contained being too alkaline. According to analyses given the *Revue Industrielle*, glass for wine bottles should yield per 100 parts: silice, 58.4; potash or soda, 11.7; lime 18.6; clay and oxide of iron, 11; other ingredients, 0.3. Glass in bad bottles has been found to contain, silice, 52.4; potash or soda, 4.4; lime, 32.1; clay and iron, 11.1. It seems that the wine suffers principally from excess of lime. Thus, in glass composed of silice, 45, soda, 15; lime, 30, and clay, 15, for example, the wine became thick and lost its aroma. The best bottle glass contains from 18 to 20 parts lime and 59 to 60 silice; the worst, 50 to 52 silice and 25 to 30 lime.

HISSES AND THE TELEPHONE.—Sir William Thomson, referring to the telephone, said that hissing sounds cannot be carried by it as far as the graver tones. With short connections, sounds of all descriptions and tone are reproduced accurately at the receiving station, but when the stations are far apart over tones are lost and only the fundamental tone is reproduced.

## Mars' Moons and the Nebular Hypothesis.

When science brings to light new facts is the quick impulse of the scientific thinker to test by them theories and hypotheses which have won credence. Thus, when Prof. Kirkwood, of Indiana, takes up the discovery of the satellites of Mars and reviews the nebular hypothesis in the light of them, we are all attention. From a letter which Prof. Kirkwood writes to the editors of the *American Journal of Science* we quote these paragraphs:

From eight measurements of the position and distance of the inner satellite of Mars as taken by Prof. Hall within three days from the date of his first observation, Prof. Newcomb found the period to be seven hours and thirty-eight minutes. On the theory, therefore, of a circular orbit the satellite is within 8,400 miles of the planet's surface. Prof. Hall remarks that the diameters of the Mars satellites are extremely small, probably not more than 50 or 100 miles. It is interesting to observe that even with the larger limit the bodies are smaller in comparison with their primary than any other secondaries in the solar system. According to Proctor Mars revolves on its axis in  $24^h 37^m 22.735^s$ . The inner satellite, therefore, completes three orbital revolutions in less than a Martial day. How is this remarkable fact to be reconciled with the cosmogony of Laplace?

Although the period of no other satellite is less than that of the rotation of its primary, the case can hardly be regarded as wholly unique. The rings of Saturn are clouds of extremely minute secondary planetoids revolving about the primary in approximate accordance with Kepler's third law. The periods of those in the outermost ring, like that of the exterior satellite of Mars, are somewhat greater than the rotation period of the primary. Those near the outer edge of the interior bright ring revolve in the same time with Saturn, and those at the inner visible edge of the dusky ring complete a revolution in about eight hours. "These rings of Saturn, like everything cosmical, must be gradually decaying, because in the course of their motion around the planet there must be continual impacts amongst the separate portions of the mass, and of two which impinge, one may be accelerated, but it will be accelerated at the expense of the other. The other falls out of the race, as it were, and is gradually drawn in towards the planet. The consequence is that, possibly not so much on account of the improvement of telescopes of late years, but perhaps simply in consequence of this gradual closing in of the whole system, a new ring of Saturn has been observed inside of the two old ones, what is called from its appearance the crape ring, which was narrow when first observed, but is gradually becoming broader. That is formed of the lagards, as it were, which have been thrown out of the race, and which are gradually falling in towards the planet's surface."

The process by which, in the case of Saturn's rings, the period of revolution has become less than that of the planet's rotation is here clearly indicated. It is not impossible that a similar process may have been in operation during the forming period of the Martial system. Unless some such explanation as this can be given, the short period of the inner satellite will doubtless be regarded as a conclusive argument against the nebular hypothesis.

ARTIFICIAL COLOR IN BRANDY.—It is a well known fact, says *Fresenius' Zeitschrift*, that the longer brandy is permitted to remain in the cask the darker it gets in color—due to the taking up of the coloring matter in the wood. Liquor dealers have a strong inclination to have nothing but old brandy, so-called, in stock, therefore color their young liquor by means of burnt sugar (caramel). This falsification is at once apparent to the practiced tippler, but a chemical test is nevertheless very desirable. Herr E. Carles discovered that the falsification referred to can be detected by means either of the albumen of an egg or sulphate of iron. If to two samples of brandy, the one colored by natural means, the other by sugar, one-sixth of their volume of albumen be added, they will become turbid. On clearing, either by being permitted to stand quietly or by filtration, the artificially colored liquor will retain its color while the unadulterated will be almost colorless. The addition of a concentrated solution of sulphate of iron will not affect the tampered liquor, while the true article will be colored to a blackish green color, more intense as the brandy is aged.

SOCIAL INSECTS.—In an article in the *Popular Science Monthly*, E. R. Leland writes: "The life of ceitons or carnivorous ants is not all work, however; they seem frequently to be employed in a way that looks like recreation. This always takes place in a sunny nook. The main column of the army and the branch columns are in their ordinary relative positions, but instead of pressing forward eagerly and plundering right and left, they seem to be smitten with a fit of laziness. Some walk slowly about, others brush their antennae with their fore feet, but the drollest sight is their cleaning one another. Here and there an ant may be seen stretching forth first one leg and then another to be brushed and washed by one or more of its comrades, who perform the task by passing the limb between the jaws and the tongue, finishing by giving the antennae a friendly wipe."



Table of Highest and Lowest Sales in S. F. Stock Exchange.

Name of Company.	Week Ending Sep. 26.	Week Ending Sep. 27.	Week Ending Oct. 6.	Week Ending Oct. 11.
Alpha.....	13 1/2	14 1/2	12 1/2	14 1/2
Alta.....	6 1/2	6 1/2	6 1/2	6 1/2
Andes.....	75c	60c	75c	1 1/2
Baltimore Con.....	75c	55c	50c	75c
Belcher.....	7 1/2	6 1/2	6 1/2	6 1/2
Bentley.....	18 1/2	18 1/2	18 1/2	18 1/2
Bullion.....	8 1/2	8 1/2	8 1/2	8 1/2
Caledonia.....	4 1/2	4 1/2	4 1/2	4 1/2
California.....	23 1/2	20 1/2	23 1/2	20 1/2
Challenge.....	36 1/2	36 1/2	36 1/2	36 1/2
Chollar.....	36 1/2	36 1/2	36 1/2	36 1/2
Confidence.....	5 1/2	5 1/2	5 1/2	5 1/2
Con Imperial.....	95c	85c	1 1/2	1 1/2
Crown Point.....	4 1/2	4 1/2	4 1/2	4 1/2
Coso Con.....	4 1/2	4 1/2	4 1/2	4 1/2
Dayton.....	55c	50c	50c	50c
Eureka Con.....	49 1/2	45 1/2	45 1/2	45 1/2
Exchequer.....	22 1/2	22 1/2	22 1/2	22 1/2
Geddes & Bertrand.....	9 1/2	9 1/2	9 1/2	9 1/2
Gen Thomas.....	16 1/2	16 1/2	16 1/2	16 1/2
Grand Prize.....	1 1/2	1 1/2	1 1/2	1 1/2
Gila.....	1 1/2	1 1/2	1 1/2	1 1/2
Golden Chariot.....	1 1/2	1 1/2	1 1/2	1 1/2
Gould & Curry.....	9 1/2	9 1/2	9 1/2	9 1/2
Hale & Norcross.....	45c	45c	45c	45c
Hussey.....	2 1/2	2 1/2	2 1/2	2 1/2
Justice.....	16 1/2	16 1/2	16 1/2	16 1/2
Jackson.....	6 1/2	6 1/2	6 1/2	6 1/2
K K Con.....	5 1/2	5 1/2	5 1/2	5 1/2
Kentuck.....	6 1/2	6 1/2	6 1/2	6 1/2
Knickerbocker.....	15c	10c	15c	10c
Kossuth.....	1 1/2	1 1/2	1 1/2	1 1/2
Lady Bryan.....	1 1/2	1 1/2	1 1/2	1 1/2
Lady Wash.....	1 1/2	1 1/2	1 1/2	1 1/2
Leopard.....	1 1/2	1 1/2	1 1/2	1 1/2
Leviathan.....	20c	15c	20c	15c
Leeds.....	2 1/2	2 1/2	2 1/2	2 1/2
Madoc.....	1 1/2	1 1/2	1 1/2	1 1/2
Manhattan.....	1 1/2	1 1/2	1 1/2	1 1/2
Mansfield.....	60c	40c	60c	40c
Meadow Valley.....	55c	50c	50c	50c
Mexican.....	10 1/2	10 1/2	10 1/2	10 1/2
North Con Virginia.....	60c	60c	60c	60c
New York.....	40c	35c	40c	35c
Niagara.....	1 1/2	1 1/2	1 1/2	1 1/2
Northern Belle.....	18 1/2	18 1/2	18 1/2	18 1/2
New Coso.....	65c	60c	65c	60c
Occidental.....	17 1/2	17 1/2	17 1/2	17 1/2
Ophir.....	17 1/2	17 1/2	17 1/2	17 1/2
Overman.....	25 1/2	25 1/2	25 1/2	25 1/2
Pacific.....	1 1/2	1 1/2	1 1/2	1 1/2
Phil Sheridan.....	1 1/2	1 1/2	1 1/2	1 1/2
Pioneer.....	5c	5c	5c	5c
Prospect.....	1 1/2	1 1/2	1 1/2	1 1/2
Raymond & Ely.....	13 1/2	13 1/2	13 1/2	13 1/2
Rock Island.....	15c	15c	15c	15c
Savage.....	1 1/2	1 1/2	1 1/2	1 1/2
Seg Belcher.....	40c	40c	40c	40c
Sierra Nevada.....	4 1/2	4 1/2	4 1/2	4 1/2
Silver Hill.....	4 1/2	4 1/2	4 1/2	4 1/2
South Chariot.....	1 1/2	1 1/2	1 1/2	1 1/2
Succor.....	1 1/2	1 1/2	1 1/2	1 1/2
Trojan.....	75c	65c	75c	65c
Union Con.....	6 1/2	6 1/2	6 1/2	6 1/2
Utah.....	11 1/2	11 1/2	11 1/2	11 1/2
Wells Fargo.....	45c	45c	45c	45c
Woodville.....	1 1/2	1 1/2	1 1/2	1 1/2
Yellow Jacket.....	10 1/2	9 1/2	10 1/2	9 1/2

Sales at S. F. Stock Exchange.

FRIDAY, A. M., OCT. 5.	600 Ventana.....	40c	75c
1230 Alta.....	13c	12c	13c
555 Alpha.....	10c	10c	10c
1330 Bullion.....	13c	13c	13c
75c Belcher.....	75c	75c	75c
1235 Best & Belcher.....	20c	20c	20c
775 Baltimore Con.....	1 1/2	1 1/2	1 1/2
2925 Con Imperial.....	1 1/2	1 1/2	1 1/2
3070 Crown Point.....	30c	30c	30c
3200 California.....	31c	31c	31c
750 Con Virginia.....	33c	33c	33c
695 Caledonia.....	41c	41c	41c
265 Confidence.....	1 1/2	1 1/2	1 1/2
250 Challenge.....	1 1/2	1 1/2	1 1/2
2330 Dayton.....	65c	65c	65c
75c Dardanelles.....	2 1/2	2 1/2	2 1/2
1030 Exchequer.....	13c	13c	13c
85 Gould & Curry.....	10c	10c	10c
1105 Hale & Norcross.....	17c	17c	17c
1810 Justice.....	15c	15c	15c
705 Julia.....	31c	31c	31c
600 Kentuck.....	71c	71c	71c
550 Madison.....	70c	70c	70c
3220 New York.....	70c	70c	70c
390 Overman.....	25c	25c	25c
50 Occidental.....	1 1/2	1 1/2	1 1/2
185 Ophir.....	16c	16c	16c
3300 Rock Island.....	95c	95c	95c
165 Sierra Nevada.....	51c	51c	51c
40c Savage.....	75c	75c	75c
1150 Succor.....	31c	31c	31c
1105 Silver Hill.....	17c	17c	17c
20c Seg Belcher.....	40c	40c	40c
430 Union Con.....	67c	67c	67c
160 Utah.....	12c	12c	12c
645 Woodville.....	18c	18c	18c
1830 Yellow Jacket.....	10c	10c	10c
AFTERNOON SESSION.			
605 Andes.....	95c	95c	95c
250 Alps.....	12c	12c	12c
200 Arizona.....	30c	30c	30c
1350 Argentina.....	90c	90c	90c
875 Benton.....	2 1/2	2 1/2	2 1/2
885 Boyle.....	40c	40c	40c
1300 Combustion.....	45c	45c	45c
200 Con Virginia.....	15c	15c	15c
250 Cherokee.....	25c	25c	25c
945 DeFrees.....	1 1/2	1 1/2	1 1/2
1000 Endowment.....	2 1/2	2 1/2	2 1/2
10 Eureka Con.....	50c	50c	50c
300 Grand Prize W.....	1 1/2	1 1/2	1 1/2
600 Georgia.....	45c	45c	45c
50 Golden Chariot.....	75c	75c	75c
575 Gila.....	1 1/2	1 1/2	1 1/2
600 Hussey.....	40c	40c	40c
1000 Hornet.....	50c	50c	50c
800 Independent.....	1 1/2	1 1/2	1 1/2
750 Julia.....	31c	31c	31c
1240 K K Con.....	45c	45c	45c
550 Lady Wash.....	13c	13c	13c
370 Leopard.....	1 1/2	1 1/2	1 1/2
330 Leviathan.....	15c	15c	15c
500 Lee.....	50c	50c	50c
1225 Leeds.....	2 1/2	2 1/2	2 1/2
1200 Mansfield.....	55c	55c	55c
1250 Modoc.....	1 1/2	1 1/2	1 1/2
300 Meadow Valley.....	50c	50c	50c
170 North Con Virginia.....	55c	55c	55c
700 Niagara.....	62c	62c	62c
75 Northern Belle.....	20c	20c	20c
10 New Coso.....	1 1/2	1 1/2	1 1/2
1550 Navajo.....	2 1/2	2 1/2	2 1/2
155 Ophir.....	1 1/2	1 1/2	1 1/2
550 Panther.....	1 1/2	1 1/2	1 1/2
100 Pawnee.....	50c	50c	50c
850 Peytona.....	30c	30c	30c
155 Prospect.....	1 1/2	1 1/2	1 1/2
165 Rye Patch.....	4 1/2	4 1/2	4 1/2
2200 Silver Hill.....	1 1/2	1 1/2	1 1/2
1150 Santiago.....	1 1/2	1 1/2	1 1/2
750 South Justice.....	1 1/2	1 1/2	1 1/2
100 Star.....	1 1/2	1 1/2	1 1/2
700 South Con.....	1 1/2	1 1/2	1 1/2
200 South Navajo.....	1 1/2	1 1/2	1 1/2
1400 Succor.....	75c	75c	75c
230 Trojan.....	1 1/2	1 1/2	1 1/2

100 Bechtel.....	23c	20c	23c
1050 Baltimore Con.....	1 1/2	1 1/2	1 1/2
1100 Bodie.....	11c	11c	11c
2430 Benton.....	75c	75c	75c
380 Boyle.....	60c	60c	60c
1230 Challenge.....	12c	12c	12c
1150 Cherokee.....	23c	23c	23c
1300 Combustion.....	45c	45c	45c
950 Dayton.....	45c	45c	45c
1800 DeFrees.....	1 1/2	1 1/2	1 1/2
175 Dardanelles.....	2 1/2	2 1/2	2 1/2
750 Endowment.....	2 1/2	2 1/2	2 1/2
100 El Dorado S.....	50c	50c	50c
60 Eureka Con.....	45c	45c	45c
500 Grand Prize W.....	1 1/2	1 1/2	1 1/2
100 Golden Chariot.....	75c	75c	75c
200 Globe.....	75c	75c	75c
2510 Hussey.....	45c	45c	45c
900 Hornet.....	50c	50c	50c
900 Independent.....	1 1/2	1 1/2	1 1/2
530 Jackson.....	30c	30c	30c
600 Joe Scates.....	30c	30c	30c
60 K K Con.....	30c	30c	30c
200 Kossuth.....	50c	50c	50c
975 Leopard.....	1 1/2	1 1/2	1 1/2
1700 Leviathan.....	15c	15c	15c
730 Leeds.....	2 1/2	2 1/2	2 1/2
1330 Modoc.....	1 1/2	1 1/2	1 1/2
900 Monumental.....	15c	15c	15c
355 Manhattan.....	45c	45c	45c
300 Mansfield.....	55c	55c	55c
200 New Coso.....	1 1/2	1 1/2	1 1/2
925 Navajo.....	2 1/2	2 1/2	2 1/2
655 Northern Belle.....	1 1/2	1 1/2	1 1/2
1000 Ophir.....	1 1/2	1 1/2	1 1/2
50 North Con Vir.....	50c	50c	50c
400 Niagara.....	1 1/2	1 1/2	1 1/2
500 Panther.....	1 1/2	1 1/2	1 1/2
100 Phenix.....	15c	15c	15c
300 Peytona.....	30c	30c	30c
250 Prospect.....	1 1/2	1 1/2	1 1/2
750 Rye Patch.....	4 1/2	4 1/2	4 1/2
800 Rock Island.....	95c	95c	95c
3430 Silver Hill.....	1 1/2	1 1/2	1 1/2
745 Star.....	1 1/2	1 1/2	1 1/2
1500 South Navajo.....	2 1/2	2 1/2	2 1/2
2050 Silver Hill.....	1 1/2	1 1/2	1 1/2
300 Succor.....	75c	75c	75c
400 South Justice.....	1 1/2	1 1/2	1 1/2
250 Silver City.....	75c	75c	75c
170 South Con.....	90c	90c	90c
3050 Trojan.....	1 1/2	1 1/2	1 1/2
750 Tucson.....	75c	75c	75c
1100 Ward.....	1 1/2	1 1/2	1 1/2
750 Wells Fargo.....	45c	45c	45c
710 Woodville.....	1 1/2	1 1/2	1 1/2
1000 Yuma.....	1 1/2	1 1/2	1 1/2
1895 Alta.....	1 1/2	1 1/2	1 1/2
1895 Alpha.....	1 1/2	1 1/2	1 1/2
340 Belcher.....	65c	65c	65c
1065 Best & Belcher.....	22c	22c	22c
425 Baltimore Con.....	1 1/2	1 1/2	1 1/2
775 Bullion.....	12c	12c	12c
1615 California.....	32c	32c	32c
20 Chollar.....	36c	36c	36c
100 Con Virginia.....	33c	33c	33c
130 Confidence.....	1 1/2	1 1/2	1 1/2
4015 Con Imperial.....	1 1/2	1 1/2	1 1/2
850 Crown Point.....	31c	31c	31c
500 Challenge.....	1 1/2	1 1/2	1 1/2
1500 Caledonia.....	41c	41c	41c
1000 Dayton.....	65c	65c	65c
200 Dardanelles.....	2 1/2	2 1/2	2 1/2
780 Exchequer.....	11c	11c	11c
1350 Gould & Curry.....	11c	11c	11c
155 Hale & Norcross.....	17c	17c	17c
1755 Justice.....	14c	14c	14c
790 Julia.....	31c	31c	31c
65 Kentuck.....	65c	65c	65c
875 Mexican.....	1 1/2	1 1/2	1 1/2
1140 New York.....	70c	70c	70c
275 Ophir.....	18c	18c	18c
305 Overman.....	25c	25c	25c
50 Occidental.....	1 1/2	1 1/2	1 1/2
1000 Rock Island.....	95c	95c	95c
1250 Sierra Nevada.....	51c	51c	51c
10 Seg Belcher.....	40c	40c	40c
1030 Succor.....	31c	31c	31c
440 Succor.....	31c	31c	31c
2175 Silver Hill.....	17c	17c	17c
390 Union Con.....	67c	67c	67c
650 Utah.....	12c	12c	12c
80 Woodville.....	18c	18c	18c
1220 Yellow Jacket.....	10c	10c	10c
830 Alta.....	12c	12c	12c
390 Alps.....	2 1/2	2 1/2	2 1/2
705 Andes.....	95c	95c	95c
1375 Argentina.....	90c	90c	90c
200 Benton.....	1 1/2	1 1/2	1 1/2
200 Boyle.....	60c	60c	60c
100 Bechtel.....	23c	23c	23c
815 Belcher.....	65c	65c	65c
600 Best & Belcher.....	22c	22c	22c
110 New York.....	70c	70c	70c
275 Ophir.....	18c	18c	18c
305 Overman.....	25c	25c	25c
50 Occidental.....	1 1/2	1 1/2	1 1/2
1000 Rock Island.....	95c	95c	95c
1250 Sierra Nevada.....	51c	51c	51c
10 Seg Belcher.....	40c	40c	40c
1030 Succor.....	31c	31c	31c
440 Succor.....	31c	31c	31c
2175 Silver Hill.....	17c	17c	17c
390 Union Con.....	67c	67c	67c
650 Utah.....	12c	12c	



# MINING SUMMARY.

The following is mostly condensed from journals published in the interior, in proximity to the mines mentioned.

## California.

### AMADOR.

**COVER.**—Amador Ledger, Oct. 6: The mill is idle, but there is considerable activity at the mine. Sinking the new shaft is proceeding vigorously. Large piles of ore are accumulating on the dumps, and everything connected with the mine looks prosperous. One new feature is the fling of new drilling machinery of the most improved pattern to work by compressed air.

**LINCOLN.**—We learn that a number of mechanics have been engaged lately in repairing the shaft. This looks as though work was to be resumed at no distant day.

**KENNEDY.**—Assessments are yet the order of the day with this mine. At the works the taking out of rock progresses. The dump of the mill is full of quartz. It is said that the ore prospects well, but a crushing mill will have to be made before its paying quality is placed beyond a doubt. **GRANITE.**—This is the old black mine, on the east side of the river, which so much was said last year. The new 10-stamp mill, in process of erection by Knight & Co., of Sutter creek, will be finished inside of two weeks. Some time must elapse, however, before the crushing of rock can be commenced. The laying of pipe and cutting branch ditches will consume both time and money. Good judges say that when once the mine is put in working shape, it will steadily repay all the preliminary expenses. The quartz prospects well, and there is any quantity of it.

**COMET.**—In the Comet a well-defined ledge has been struck at a depth of 170 feet from the surface. The ore-body is 18 inches wide, and seems to widen as sinking progresses. It prospects well.

**ANOTHER MILL.**—Amador Dispatch, Oct. 6: A 10-stamp quartz mill is being erected about a mile above Drytown, on Dry creek, by Mr. Davis, of Plymouth, at which place he has recently discovered a rich vein of quartz. The mill will be used principally to do custom work until Mr. Davis gets his mine opened.

**THE KENNEDY.**—The Kennedy mill is now about full of rock, and preparations are being made to commence crushing.

**THE PENNSYLVANIA MINE.**—The shaft in this mine near the Gover, is now down about 100 feet, where the lead is seven feet wide, and the rock yields \$12 per ton.

**POTOMI MINE.**—Preparations are now being made to thoroughly work the Potomac mine, near Drytown, which has been lying idle for some time. The old shaft was down about 270 feet but allowed to fill up with water, and the old timbering to decay. The water has all been hoisted out, and the shaft retimed about half way down. A site has been graded for the erection of a new mill. The rock at the bottom of the shaft is of a fine quality.

### CALAVERAS.

**BANNER.**—Calaveras Chronicle, Oct. 6: The new machinery lately put upon the Banner mine at Mosquito was in motion last Monday. Excepting a little "stiffness" incident to new machinery, but soon working admirably. The pumps are rapidly freeing the mine of water. The Banner—better known, perhaps, as the "Grasshopper"—has a reputation for richness second to no mine in the county.

**WORK RESUMED.**—Operations have been resumed in the well-known Dursey gravel mine in Chili gulch, after an enforced idleness of several months for lack of water. There is no water for milling purposes, but the hands have been set at work running levels and getting ready.

**TIGER MINE.**—We have it from reliable authority that work will shortly be resumed on the well-known Tiger mine, at Rich Gulch. We learn that the proprietor, C. H. Livingston, Esq., has finally consented to the placing of the mine in the hands of a joint stock company, in obedience to the wishes of some San Francisco capitalists. The intention is to erect a 40-stamp mill this fall, and work the mine systematically and on a large scale.

**RICH ROCK.**—A small lot of quartz from the ledge recently discovered near Mosquito, by Henry Harryhausen, crushed in Garland's mill, paid upwards of \$70 per ton. The rock was a small lot worked more for the purpose of proving the vein than anything else, and came from near the surface.

**ASBESTOS.**—Some very fine samples of asbestos—in fact, the best specimens of the article we ever saw—have been left with us by Mr. Robert Hoskinson, of Lower Rich Gulch. The fibres of the mineral refined are not extraordinarily long, but they are as fine, soft and pliable as silk.

### FRESNO.

**FRESNO G. M. CO.**—Fresno Exporter, Oct. 3: Work on this mine is going ahead briskly. The vein has been prospected sufficiently to satisfy the stockholders that it is extensive and rich. The President of the company, W. D. DeFrees, has gone to San Francisco to purchase the machinery for a quartz mill. As soon as the machinery arrives a five-stamp mill will be erected. The engine will have a capacity for running 10 stamps, and should the mine develop as favorable as now anticipated, the additional five stamps will be put in. The flattering prospects of the Fresno gold mine has created an interest in quartz mining in its neighborhood, and several mines have been located and prospecting is still going on. From present appearances, the long neglected quartz interests of Fresno county will be thoroughly tested. The indications are favorable for the early opening of a number of rich quartz mines.

**RICH.**—We are informed that Sam and E. Dennis' quartz mine, on the Fresno river, is turning out exceedingly rich. They are taking out from \$18 to \$20 per day, crushing the rock with an ordinary sledge hammer and then panning it out.

### INYO.

**SUSPENSION.**—Coso Mining News, Oct. 6: The Cuervo mining company, that has been operating here so successfully for several months, under the very efficient management of Mr. W. H. Rodda, Superintendent, has suspended operations on account of some legal matters necessary to be settled. We are assured by Mr. Rodda that the suspension is but temporary. He goes down to the day-to-day to make arrangements for operating on a more extensive scale at an early day. The Cuervo is one of the finest properties in Inyo county. The company closes its business with a clean record.

**BULLION SHIPMENTS.**—For some time there has been no bullion shipped from the Rex Montis mine, for the reason that the charcoal supply for melting had become exhausted. This difficulty was overcome by burning some more, and last Thursday there arrived here, upon the stage, 13 bars of fine bullion, weighing 395 pounds and valued at \$10,500. On the 2d inst. the Emigrant company shipped 99 pounds of fine bullion, valued at \$1,250. Same day the Minuetine shipped 224 pounds fine bullion, valued at \$3,500.

### LAKE.

**GREAT WESTERN.**—Democrat, Oct. 6: Having occasion to go to the Great Western quicksilver mine, the other day, we were surprised at the amount of work going on in that section. A steam saw-mill, running to its fullest capacity, keeps a large force of men working constantly at work. The mine is running a large force of men under the supervision of Mr. Roca. Following are the shipments from this place during the last two weeks: Great Western quicksilver mine to H. M. Newhall, San Francisco, 238 flasks of quicksilver; Sulphur Banks quicksilver mine to Parrott & Co., S. F., 329 flasks; Napa Con. quicksilver mine to D. Meyers, S. F., 76 flasks; T. Wright to John Hanscom, S. F., 14 flasks of quicksilver. There is also 100 flasks being unloaded to-night.

### MONO.

FROM BENTON.—Coso Mining News, Oct. 6: From Mr.

E. R. Miner, Wells, Fargo & Co.'s agent at Benton, we learn that times at Benton are about as lively as ever, with better prospects for the future. Two mills are running on good ore, but the Diana mill had been compelled to suspend for a short time for want of chemicals. A large pump has been put upon the Comanche mine to pump out the water, which is 40 feet deep in the shaft. Albert Black, who sold out his interests in mines and mills there for \$120,000, and spent the entire summer with his wife in the East, returned last spring, and is now engaged in the saw-mill business, besides having interests in the Diana, being President of the same. Lumber is furnished from this mill to supply the wants of Marietta, Belleville and other places in the vicinity. The Laura mine has, the present summer, turned out some very fine ore and in sufficient quantities to pay for running the mine for a year and having a surplus on hand. The ore from this mine was worked by the Comanche and Indian Queen mines, by dry process and the White furnace for roasting. Mr. Miner does not recollect distinctly a surplus of bullion shipments for this year, as reported by him, but says they will average upwards of \$30,000 per month for all the mines at Benton, being something of an increase over those of last year. There has been an increase of population and business houses this year at Benton, and altogether the prospects for a better future are any thing but discouraging.

### MONTEREY.

**SILVER.**—Monterey Democrat, Oct. 6: In relation to the discovery of a very promising silver-bearing ledge at the headwaters of the north fork of the Little Sur, we have very recently obtained some reliable information, and we are gratified to note that it is now being vigorously worked and the development is very flattering. The ledge is about four feet in thickness on the top.

### NEVADA.

**CLEAN-UP.**—Nevada Transcript, Oct. 6: The Eureka Lumber Company, as we were informed, made a cleaning up of what is known as the McCarty ditch, near Columbia fill, this week. The yield is said to have been immense, better than any former yield in the same diggings. What the gross proceeds were in dollars and cents we dare not state, as it was given to us in confidence, but we may say it was high up in the thousands.

**SOUTH FORK MINE.**—San Juan Times, Oct. 6: The North Fork mine, an incorporated company, located at Forest City, held their annual meeting on Monday, the 1st inst. The mine is divided into 1,000 shares, quite a number of which are held by divers citizens of this place. The following named persons were elected Trustees for the ensuing year: J. B. Hunter and John Hill of this place; Mr. Hiseock, of San Francisco; John Nelson and Mr. Howell, of Forest City. A proposition was made by Judge Davidson, of Downsville, on behalf of certain English capitalists of London, to bond the mine in the sum of \$300,000 for four months, commencing October 1st, which was accepted by the company. The face of the tunnel is about 100 feet from the ledge which was struck in the tunnel. The quartz ledge at the face of the tunnel is about 14 feet wide, and assays \$320.50 to the ton in gold and silver. The enormous Eld Mountain mining company, which adjoins the North Fork, ask \$200,000 for their mine, and that mine is about half worked out. On the whole, Forest City and that section of the country has a bright outlook. Wish we could say the same for San Juan and vicinity.

### PLACER.

**QUARTZ FERRA.**—Placer Herald, Oct. 6: The Excelsior mine, near the Eclipse mill, owned and worked by the Werry brothers, is turning out some good rock. The rock has paid very well from the top down, but it is best at the bottom of the shaft, which is now about 100 feet deep. The Messrs. Werry have the mine bonded to a San Francisco company for \$13,000. The Eclipse company, under the management of Mr. Vincent, are running their mill very steadily on custom rock, and are doing, we understand, very satisfactory work. The Pugh mill, also, near Ophir, is kept busily engaged on custom work, and, as usual, gives general satisfaction. Robinson & Hersh, on Posterior flat have their shaft down about 80 feet, on a ledge that promises well. Their gold and silver yield is \$21 per ton, which is very good considering their ledge is fair ore. The Kaiser boys, whose mine is on the hill north of Ophir, and which, while back was paying so handsomely, are at present not doing much. At the Good Friday, a small force is at work taking out rock, though with what results we did not learn. Other ledges are being prospected in the Ophir district, and some of them under our information, are rich in gold and silver.

**LOWER HILL MINES.**—Dutch Flat Forum, Oct. 4: The work of extracting gravel from the Swamp Angel mine has been at a standstill for one month. This is owing to a lack of water for two reasons. First, the springs having become very low failed to furnish sufficient water to run the air blast; second, the supply of water purchased from the Little York G. M. & W. Co. to wash with once a week, for some reason was cut off entirely. The latter first is being remedied by supplying the drifts with air by means of a fire blast, the second by the construction of a large tank, which is nearly completed. The water caught in this manner will be utilized in washing twice a week, in place of once as heretofore when supplied by the ditch. The East New York tunnel is advanced 500 feet, the rock now encountered being favorable for making good progress. The Wilcox Cat, it is thought, would have been tempted before this time had not the owners been compelled to abandon the raising of the incline for the present, owing to a lack of air. This will be remedied in a short time, when the Cat will be compelled to yield up peacefully the rich treasures so long looked up in her bowels. The tunnel in this mine is completed a distance of 100 feet.

**Too Low.**—The Mule Spring Ranch mine, the next below, and located as the Planet, on the Bear river side of the divide, has a frontage of 1,500 feet. The construction of a tunnel was commenced in this mine some time since, and was completed a distance of 300 feet, but from recent surveys it was found to be considerably too high; it has, therefore, been abandoned, and another started 100 feet lower.

The property known as the Leary mine was recently purchased by W. P. Dewey, of San Francisco. Mr. Dewey in having the ground surveyed, had also a survey made of the grade of the channel, from the Swamp Angel mine to a point below the Leary ground, showing by this that the tunnel constructed by Mr. Leary, a distance of about 300 feet, was too high. The contract to run the tunnel on a lower grade has been let to some Dutch Flat miners, and the work of constructing the same is now under full headway, running day and night.

**LIBERTY HILL MINES.**—The Little York G. M. & W. Co. are making active preparations for the approaching season. The bedrock out in the Liberty mine has been completed, and the greater part of the flume laid. Seven hundred feet of powder drifts have been blown and exploded, pulverizing the banks in a satisfactory manner for washing. A tunnel 700 feet in length, tapping the ground known as the Union mine, is being enlarged, and in which will be constructed a five-foot flume, through which they will wash the coming winter.

**REMINGTON HILL MINES.** The tunnel started by the Rhode Island company recently and held to run towards the line of the Wide West mine, is already completed a distance of 250 feet. At this point there is still three feet of bedrock to contend with. The gravel overhead is of sufficient richness to pay good dividends for drifting. The tunnel will be advanced 60 feet further, when side drifts will be opened for the purpose of breasting out. A large part of the work is being done by the Wide West mine. The proprietors of this valuable property, Messrs. McCann & Meyers, are sparing neither pains nor expense to have all things connected with their mine fitted up in an advantageous manner for the winter's work.

### SANTA BARBARA.

**OIL.**—Santa Barbara Advertiser, Oct. 7: The Santa Barbara oil company are now drilling night and day. They have reached a depth of 125 feet, and are still pushing down. They have a large tank up to receive the oil, when they shall require it.

### TUOLUMNE.

**IMPROVED MINE.**—Tuolumne Independent, Oct. 6: A San Francisco company, preparing to mine Chapman hill, near Yankee hill, with the new hydraulic gravel elevator. One of these machines is on the way, and was expected to arrive at Columbia yesterday. Mr. Barron, the active Superintendent, is preparing the claim for the new machine, and expects to have everything ready for operation by the time a full supply of water is obtained. From prospecting, it is ascertained that there is a large sink of gravel in the hill, which in times of high water, will pay well wherever tapped by means of shafts. Water, and other difficulties of working by that method, caused it to be abandoned as unprofitable, although the gravel was known to be good. There being no dump, and too much debris to remove by hoisting, it was decided by the present company to put on one of the newly invented hydraulic gravel elevators. By this machine, water and gravel can be sluiced uphill, and mines worked that had no dump. [This machine was described and illustrated recently in the MINING AND SCIENTIFIC PRESS.—Eds. Press.]

**RICH QUARTZ.**—Ozden & Co., at their claim in the gulch below Bix's brewery, Columbia, are taking out good pay. But what is better, they are actually being finding small pockets, and lately have struck a series of good ones. One day last week they emptied one of \$319.50 in gold. It is the opinion of old quartz miners that these young men will develop a regular lode of great value. That locality has been rich in gold for the past 25 years, and placer mining below has proved highly remunerative. The fact is that the gravel below has been fed with gold from rich quartz ledges, and Ozden & Co. seem to be proving this theory correct. They are now down between 50 and 75 feet.

## Nevada.

### WASHOE DISTRICT.

**CONSOLIDATED VIRGINIA.**—Gold Hill News, Oct. 10: Daily yield, 500 tons, from the regular producing sections, keeping all the mills steadily running with a surplus on hand. A considerably increased milling capacity could easily be kept supplied. The principal improvement mentioned in the mine is at the 1200-ft level, where a new body of ore, some 20 feet in width and assaying over \$100 to the ton from average car samples, is being developed. This new body extends to the southward and eastward from the main ore channel, and is a very important development in that direction. The diamond drill boring from the 1550-ft level to tap the water in the southeast portion of the 1400-ft level has not yet effected its object, but is expected to very shortly. At the 1750, or lowest level, recently opened, the main drift cross-cutting the vein westward continues in quartz and porphyry, and has not yet run through into the west ore vein as shown in the level above. The ore in the other cross-cuts at this level thus far does not turn out as high grade as desired. Considerable timbering in the main C. & C. drift at this level is found necessary and being done at present. At the 1650-ft level the main drift westward the Consolidated Virginia shaft is in porphyry and low grade ore. It will be nearly two months before the connection is made. The south branch drift, to open up the ore stores in that direction, is pushing ahead in hard rock. The ore stores and breasts at this level continue their rich yield, especially as they are further developed to the north and west. The ore stores and breasts of the 1400-ft level are showing and yielding plenty of high grade ore, and the same may be said of the 1300-ft level. Large ore reserves at this point which can be taken out whenever required.

**CALIFORNIA.**—Daily yield, 675 tons, the various ore stores and breasts looking well, and yielding as usual. The main drift south at the 1400-ft level from the Ophir mine is in 375 feet, following the west wall. At the 1750-ft level the main west drift cross-cutting the vein is in 113 feet beyond the winze, with the face of the drift in low grade quartz and porphyry. It is about passing through into the west ore vein. The drift will be pushed through to the west end of the ore channel as speedily as possible, and breast and low grade ore will be developed. At the 1650-ft level the main west drift is in 113 feet, following the west wall. At the 1750-ft level the main west drift cross-cutting the vein is in 113 feet beyond the winze, with the face of the drift in low grade quartz and porphyry. It is about passing through into the west ore vein. The drift will be pushed through to the west end of the ore channel as speedily as possible, and breast and low grade ore will be developed. At the 1650-ft level the main west drift is in 113 feet, following the west wall. At the 1750-ft level the main west drift cross-cutting the vein is in 113 feet beyond the winze, with the face of the drift in low grade quartz and porphyry. It is about passing through into the west ore vein. The drift will be pushed through to the west end of the ore channel as speedily as possible, and breast and low grade ore will be developed.

**BEST & BELCHER.**—The connection between the Gould & Curry 1900-ft level and the Savage yield is now being completed, the drift south at that level is being extended into the Best & Belcher. It will be continued through that mine to the Consolidated Virginia, thus establishing an important connection.

**CHOLLAR-POTOSI.**—Daily yield 75 tons, the average assay of which is \$22.50 per ton. The main drift east at the 1750-ft level continues pushing ahead in very hard rock. **YELLOW JACK.**—The main drift east at the 1750-ft level toward the new shaft is now in 355 feet from the winze; face in porphyry with fine quartz seams. The main shaft drift at this same level is in 335 feet, with the face almost wholly in very favorable looking quartz. At the new working shaft to the eastward, the powerful new machinery was started into operation yesterday, and everything looked bright. The main drift east at the 1750-ft level, which was named last night, the new "kicker" or "skip" raising the rock and water and dumping the same in a very effective style.

**JUSTICE.**—Daily yield of ore from 334 to 400 tons, which is taken from the various producing portions of the mine, from the 1000 to the 700-ft level. The stores are looking as usual and yielding the usual quality of ore. The upraise from the 700-ft level to the 1000-ft level has been attained a height of 185 feet on the inclination of the vein. The 1150-ft level south drift is making good progress, with the face in quartz carrying streaks of ore.

**CON. EAST JUSTICE.**—This is a consolidation of some valuable mining locations lying to the eastward of the Alta, northward from the Sucker and Silver Hill mines, and east of the Teller mine. It is a fine body of ore, and is east or bonanza ore channel of the Comstock. All preliminary preparations having been completed, work is actively commenced by sinking of a three-compartment shaft at the most eligible point.

**GOULD & CURRY.**—Connection between the south drift at the 1900-ft level and the drift north from the Savage joint winze was made on Monday evening, a small opening being made. Since then the opening has been enlarged to the full size of the drift, and a fine and very much needed circulation of air is established, the draft being southward and up through the joint winze. Sinking the main Gould & Curry incline is discontinued at present on account of too much water.

**WHITE LEAD.**—This company is among the most recent incorporations in the mining group. Its ground is located about 1,200 feet east of the Alta and the same distance north of the Sucker. It shows a well-defined ledge running the entire length of the claim, and it is evidently the white lode from which mining experts expect so much.

**JULIA COV.**—The main drift south, at the 1900-ft level, is pushing ahead at the usual lively rate in good, healthy quartz, giving a fine yield. Cross-cutting a 500-foot west wall, the shaft, has reached the ore vein, 70 feet west from the main drift south, and is 20 feet into the ore vein, showing low-grade quartz thus far. It has 70 or 50 feet to go in order to reach the west wall.

**SAVAGE.**—The work of putting the pumps in place is being urged forward as energetically as possible, and the prospects are good for completion this week.

**LETITIA.**—Everything in this mine is going well, and the engine will be started up to-morrow morning. The hoisting or gallow frame is built strongly and is 20 feet higher than the old one.

**BULLION.**—Sinking the incline below the 1500-ft level is making four feet a day, no water being encountered. The east cross-cut on the 1700-ft level is making fair progress in more favorable conditions than heretofore met with. **IMPERIAL COV.**—Good work is being done sinking the south winze below the 2125-ft level to connect with the north drift from the 2200-ft level of the Yellow Jacket.

**SOUTH COMSTOCK.**—Work actively resumed with three shifts of men. The water is all out and cross-drifting at the 200-ft level is commenced to intersect the vein.

**BELCHER.**—Face of south drift at the 1900-ft level in porphyry and streaks of quartz carrying some ore. **SILVER HILL.**—The drift south at the 1750-ft level is progressing well, and the mine from the 1500-ft level to connect with it is making good sinking progress.

**CROWN POINT.**—The ore yield from the 1600-ft level of the old upper mine holds out better than was expected and is likely to extend some distance downward.

**FRANK.**—At the 1150-ft level the main drifts north and south are making the usual good progress. Face of south drift in hard rock; north drift in softer material.

**TRIX PRICKS.**—Preparations are being made for resuming sinking in the new shaft; also for the erection of steam hoisting works. The old mine drifts and cross-cuts are being cleaned out.

**HOMERSTAD.**—On account of doing certain necessary work on the surface but little progress has been made in sinking the main shaft during the past week.

**SILVER HILL.**—The shaft at the 50-ft level is completed, and drifting toward the ore vein is well started.

**UNION COV.**—Repairs on 1300-ft level completed and work in east cross-cut commenced.

**EXCELSIOR.**—The consolidation north drift on the 2000-ft level is making excellent headway in a mixture of porphyry and quartz.

**LADY HIRSH.**—The financial difficulties of the company will soon be properly arranged, when the new machinery will be started up and then the development of the mine will be actively proceeded with.

**ORION.**—Work on the 1900-ft level is being pushed ahead without change of material encountered.

**CALIFORNIA.**—Some improvement is noticeable in the drift north at the 1400-ft level.

**ALTA.**—Still cross-cutting on the 1050-ft level. Cross-cut No. 1 has good ore. Cross-cuts Nos. 2 and 3 do not show so favorably.

**OVERMAN.**—Drifts south and east on the 1300-ft level making good progress and promising well.

**HALE & NORCROSS.**—Pumps and machinery working well, and good progress will be made in reducing the water when the Savage pumps assist, which will be the last of this week.

**NEW YORK.**—Sinking the shaft below the 500-ft level continues. The bottom is in very promising vein matter.

**SECOR.**—The bottom of the shaft is in soft vein porphyry streaked with quartz giving low assays. The prospect is very encouraging.

**SUNNY TOWN.**—Total length of tunnel to-day, 13,023 feet. Main face of header soft ledge porphyry, clay and quartz.

**NIAGARA.**—Cross-cutting at the 500-ft level develops some very fine stringers of ore, giving high assays.

**JOE SCATES & GEORGE DOROLANS.**—Sinking the main shaft is progressing well, all in fine looking quartz.

### BRISTOL DISTRICT.

**MAYFLOWER.**—Pioche Record, Sept. 29: The Mayflower mine of Bristol district has now reached a depth in the incline of 175 feet; have been running in ore the last 45 feet; have made an upraise from the main incline at a depth of 150 feet, the upraise being 23 feet, all in ore. The face of the main drift is in all in ore, to the height of the drift. From samples taken from the mine by E. B. Dorsey, assays were made ranging from \$58 to \$235. The mine is worked regularly by day and night shifts. The company is a home corporation.

### ELY DISTRICT.

**RAYMOND & ELY.**—Pioche Record, Sept. 29: No especial changes to note in the mine; work continues about the same as usual, with rather more than the usual quantity of ore being extracted. The ore now being extracted is working well at the mill.

**PERKINS.**—The Bullionville furnace has been closed down and is being thoroughly overhauled and relined. This will take over a week's time.

**PIOCHE BELLION.**—Wells, Fargo & Co. shipped during the week bullion valued at \$11,534.

**YESTERDAY** was pay-day of the Raymond & Ely employees.

### JACKRABBIT DISTRICT.

**THE SALE CONSUMMATED.**—Last Wednesday the sale of the Jackrabbit mine to M. J. McDonald and James M. Day by Garrison and Emory for \$40,000 and a one-tenth interest in the stock of the incorporation was finally completed. The deeds signed, acknowledged and delivered. E. B. Dorsey had been sent to Pioche as an expert to report on the mine to McDonald and others about to purchase, and he was agreeably surprised and pleased at the extent and body of ore disclosed to sight; it made a favorable impression as to its value, so that he reported favorably of the purchase being made, on receiving which report the bargain was closed and possession given on Wednesday. Mr. Dorsey was formerly Superintendent of the Mexican mine and mill at Virginia. On Thursday E. B. Dorsey was appointed to take charge of the mine and work commenced in good shape. A large amount of ore is now sacked on the dump and will soon be sent to the mill.

**ROYAL CITY.**—Owing to the recent sale of the Jackrabbit mine and taking charge of it by a San Francisco company, the rush and business incident to a promising new mining camp is taking place at Royal City.

### TUSCARORA DISTRICT.

**SILVER PRIZE.**—Tuscarora Times, Oct. 6: Quite an excitement was created in town, on Wednesday, by the striking of a rich stratum of gold-bearing quartz at the bottom of the incline of the Silver Prize. The ore was not only rich in free gold, but also carried horn silver, intermixed with sulphurates. Some very fine specimens were obtained. The incline of the Silver Prize is now down about 120 feet, and has a continuous ledge from the top, widening out to about three feet at bottom.

**TUGA AMERICA.**—On the 30-ft level the drift is in upwards of 300 feet, the full length showing from one to three feet of good milling ore.

**NAVJO.**—Main shaft down 175 feet, encountering a large volume of water, making progress necessarily slow.

**GRAND PRIZE.**—The hoisting-works building nearly completed and machinery been running several days. Water still running on from the lower levels.

**RICH ASSAYS.**—On Monday last, while drifting on one of the lower levels of the De Fries mine, a body of good milling ore about four feet in width was encountered.

**TUSCARORA.**—A contract has been let to sink a new shaft, and work was commenced on the same yesterday. In the old workings the ledge looks promising and shows considerable mineral.

The Grand Prize company have shipped, during the present week, nine bars of bullion, valued at \$13,313.

The Leopard company have shipped two bars of bullion of the value of \$3,516.51.

### WHITE PINE DISTRICT.

**GOLD ASSAYS.**—White Pine News, Oct. 6: Col. Tyson, of the King mining company, who began working during the week in making assays of the ores of the company and those of adjacent mines, informs us that he is well pleased with the result of his experiments. Assays from the ore vein recently struck in the bottom drift of the King give respectively \$216 and \$345 per ton.

**PAY DAY.**—The Jennie A. employees were paid off last Tuesday. The amounts that are monthly paid out by this company and the King is a great help to this camp just at this time, and we hope to soon see their forces increased.

**BULLION SHIPMENT.**—Last Tuesday the Eberhardt & Aurora shipped by Wells, Fargo & Co. bullion valued at \$11,655.92. The Stafford company shipped \$6,075 the same day.

## Arizona.

**ITEMS.**—Arizona Enterprise, Sept. 29: The Alchabarro, Tazulito, Bonito, Unicorn and Sentinel are reported to have been sold to Messrs. Hoffman and De Grano. In the lower north tunnel in the Peck mine some exceedingly rich ore has been struck. Two bars of bullion were shipped yesterday by the Peck company. They were valued at \$3,224.63. Work is progressing rapidly on the Tiger.

(Continued on page 238.)



## THE ENGINEER.

### Painting Iron Work.

At a recent meeting of the Liverpool Engineering Society, an address of much practical value was delivered by C. Graham Smith, President of the society. We take therefrom a few paragraphs on painting iron work: The paints used for iron work are of every description, name and quality. The usual varieties employed for preserving it against corrosion may be divided into lead, iron oxide, silicate, and tar paints. Differences of opinion exist as to the relative merits of the first three descriptions, but the experience of several foremen painters connected with establishments in this town, is decidedly in favor of lead paints when of good quality and mixed with good oil without spirits. Unfortunately there are no reliable practical tests to insure good materials alone being used; consequently both the colors and the oils are often inferior in quality, and much adulterated. For these reasons and on account of cheapness iron oxide paints are by some preferred.

A little white lead mixed with the red makes it go farther, and easier to work into corners. If the coats are put on with pure red lead owing to its weight it is liable to run off; but the last coat should consist of red lead alone.

The tar paints are more often used for iron work which is not to be seen, such as water pipes, floor plates of bridges, and girders which are to be built into masonry or brickwork. It is cheap, and answers well for such purposes, and for sea work as it is said not to foul so readily as lead or other paints of a finer description.

A good rough paint of this class may be made by heating ordinary coal tar, and mixing with it finely sifted slacked lime, in the proportion of between half a pound and a pound of lime to a gallon of tar, adding sufficient naphtha to render it of a convenient consistency for laying on. This composition should be applied while hot, but care should be taken not to make it too hot, nor to keep it over the fire too long, or it will lose its essential oils and be reduced to a substance in all points resembling pitch. Some positions admit of the paint being sanded, in which case it should be done as it adds to its durability.

Before painting iron work it is usual to give it a coat of boiled linseed oil applied hot, this forms a kind of varnish and is found to be an excellent preparation for the after coats of paint. Opinions differ as to when the coat of oil should be applied. Some engineers specify that the iron shall be brushed over or dipped in oil while hot from the rolls. The efficacy of this method is doubtful as the iron in undergoing its workshop manipulation is subject to rough treatment, and portions of its surface are sure to become exposed. Others specify that the iron shall be brushed over with hot oil just previous to the various portions being placed together. This answers well for ordinary work, as by the time it has gone through the workshops the blue shales have to some extent been knocked off.

These blue shales are in a greater or less degree inseparable from the manufacture of the iron; but it is very important that they should be removed by some means or other before the paint is put on, for if not, in a short time they will peel off and bring the paint along with them. The best way to guard against this is to have the iron work put together in the yard and tested previous to either oil or paint being put upon it. A slight rust will form over the whole surface of the work, which will cause the blue shales to fall off. The rust should then be scraped off and the whole of the work rubbed down, which will render the surface peculiarly fitted for receiving the after coats of oil and paint. The oil should follow up, as closely as possible, the man cleaning the work. It is almost needless to point out that the efficiency of this method entirely depends upon the thoroughness with which it is done, and no engineer is justified in specifying it unless he proposes putting an inspector to see that it is properly performed.

### Statistics of British Railways.

The usual annual report to the Board of Trade for the last year respecting the share and loan capital, traffic, working, expenditure, and net profits of the railway companies of the United Kingdom for 1876 was issued on Wednesday. The total railway mileage for the United Kingdom at the end of December, 1876, was 16,872 miles, including 11,989 miles for England, 2,726 miles for Scotland, and 2,157 miles for Ireland. The increase for the United Kingdom over the total in 1875 is 214 miles, much the same amount of increase as in 1875 over 1874. The total nominal capital of the railway at the end of December, 1876, was £658,214,776, compared with £630,223,494 at the corresponding period of 1875. A portion of this increase is only nominal, being due to conversion operations. It is shown in the report that there is a steady increase of the capital cost per mile of open railway in the Kingdom, caused, to a great extent, no doubt, by the addition of sidings and other accommodation to existing lines to meet the increasing traffic. In 1871 the capital expenditure per mile of railway open was £35,943; in 1876 it had risen to £39,012. The amount of the guaranteed and

preferential capital was in 1876, £228,907,902, or an increase of £16,714,668 as compared with 1875, while the amount of the loans and debenture stock was £167,297,901, or an increase of £3,868,463 as compared with 1875. The amount of the ordinary capital again in 1876 was £262,008,883, or an increase of £7,468,151 as compared with 1875.

The total receipts from railway working, excluding miscellaneous receipts of various kinds, amounted to £59,917,868, or an increase of nearly a million over the previous year; the working expenditure at the same time amounted to £32,472,729, or an increase of £274,000 over the previous year; and the net earnings amounted to £27,445,139, or an increase of £661,000 over the previous year. This last increase is at the rate of two and one-half per cent. only, while the increase of nominal capital amounted to about four and one-half per cent.

### Military Bridge Building.

Very extensive bridging operations have been recently carried on on the River Elbe, by the engineers of the German army. Among other exercises gone through, says the *Iron Age*, was one of particular interest at the present moment, namely, the construction of a pontoon bridge across the river Schonebeck during the night. Nine companies of pioneers, numbering altogether 44 officers and 800 workmen, were assembled on the occasion, but only four companies were actually employed in the construction of the bridge, the remaining five companies being previously passed across the river on rafts and extended as an advance guard on the assumed enemy's side to cover the operation. The rafts employed for this preliminary operation were formed each of two pontoons coupled together. Four oarsmen and one steerer were employed on each raft, and each one carried from 35 to 40 men with their arms and accoutrements. The time occupied in thus throwing the advance guard across the river was about a quarter of an hour. The tactical idea for the manoeuvre was that the main body of an enemy's army was distant about a day's march from the Elbe, but that patrols pushed forward by him had arrived in the immediate vicinity of the river. It was therefore essential that the bridge should be constructed without these latter becoming aware that the operation was being carried on at the particular point chosen, and, consequently the utmost silence, not only in giving orders, but also in putting the material together, had to be observed. The bridge was constructed by sections of four pontoons each, in order that, should the enemy appear in force before a sufficient number of men had passed over to offer resistance, it might be readily withdrawn, and the whole task was successfully achieved, without a hitch of any kind occurring, in the space of an hour and a quarter, an opening being also arranged in the middle of the bridge to allow floating bodies to pass through.

**IRON RAILWAY SLEEPERS.**—A contract has just been let at Amsterdam for the delivery of 20,000 iron sleepers to the Netherlands State railways. The price named in the accepted tender was £6,499, the 20,000 sleepers weighing about 800 tons. It should be observed, however, that the sum named in the contract comprises the delivery and laying of the sleepers, so that the price of the sleepers at the German works may be estimated at about £5 per ton. The sleepers to be laid on the Netherlands State lines are on the Vantherin system, 10,000 of which were recently tried on the Belgian State system, and rejected after a careful trial. It is, perhaps, a little strange that the Dutch authorities did not take account of this circumstance. It is stated that the Great Central Belgian Railway Company contemplates a total discontinuance of wooden sleepers upon its system.

**OLD MORTAR.**—At the last meeting of the Liverpool Engineering Society, Mr. Wilkinson Squire, brought before the members some interesting samples of mortar. A piece from Sandown Castle, Kent, built by Henry VIII., was tested by Mr. Squire, proved to stand a tensile strain of 263 lbs. per square inch, the section tested being 1.8 square inch in area. A sample of mortar lately brought by Mr. Alfred Holt, member, from Neapolis, a city built B. C. 40, to commemorate the battle of Actium, appeared to be as hard as stone. The president thought that, on account of its rough and honeycombed appearance it bore out his theory that the goodness of ancient mortar was due to the quality of the materials rather than to any particular care then bestowed upon its mixing.

**SHORTENING THE ROUTE TO EUROPE.**—Another project intended to shorten the ocean journey between America and Europe is taking definite shape in Canada. It consists in the construction, now underway, of a branch from the Inter-Colonial Railway at Truro, N. S., to Louisbourg, Cape Breton. This port being some 200 miles nearer than Halifax, it is claimed that freight steamers which now pass Louisbourg on their way to and from Quebec and Montreal, but do not pass Halifax, can carry cabin passengers from England to Louisbourg for \$30—about the present rate by the mail steamers for steerage passengers. It is also argued that when the mail steamers cannot enter the gulf through the Straits of Belle Isle they can land their passengers and mails at Louisbourg, saving 36 to 48 hours.

### The Durability of Iron.

Major E. T. D. Myers, General Superintendent of the Richmond, Fredericksburg and Potomac railroad, has sent the *Railroad Gazette* a report of the tests of a bar of iron, which, he writes, "had done duty for more than a quarter of a century in a railroad bridge in this State. It has not crystallized in that service, although strained very frequently in every 24 hours with loads of more than 20,000 lbs. per square inch, and not unfrequently with those equal to if not slightly in excess of the elastic limit as now ascertained by experiment." A piece of this rod, 2 feet long and 1½ inches diameter, was tested by Col. D. W. Flagler, under the following conditions and with the result stated: The diameter of the sample was 1.13 inches, which we infer means that the piece of bar was turned down to that size. The area of cross section was 1.0028 inches, and the length between shoulders 10 inches. This sample was subjected to a tensile strain of 1,000 lbs., or 997.2 lbs. per square inch of section. This was then taken off and increased 1,000 lbs., and this was repeated until the bar finally broke, the load being increased each time 1,000 lbs. To quote the language of Col. Flagler: "Each time after the load was put on the bar the extension was measured and the load was taken off and the restoration was measured." The test piece did not take any permanent set until it had been strained 28 times with a load of that many thousands pounds, or 27,923.6 lbs. per square inch. Up to 36,000 lbs. "the permanent set was almost inappreciable." With a load of 39,000 lbs., or 38,891.4 lbs. per square inch, the iron began to fail rapidly. At a strain of 54,250 lbs. per square inch of original section it broke, having stretched 2.44 inches, the diameter of the fracture being 0.893 square inches, so that the strain per square inch of fractured area was 60,750 lbs.

### The Pittsburg Mine.

The company owning the Pittsburg, or old Wigham mine, located on the slope of the hill about a mile and a half southeast of this city, have recently incorporated. The capital stock is divided into 100,000 shares and placed at the value of one dollar per share. On Tuesday says the *Nevada County Gazette*, we visited the mine, and after looking things well over we do not hesitate to predict that before two years rolls around it, will sell for several times its present valuation. The hoisting works which have been put up since the present company took hold of the mine and which took the place of the ones burned a few years ago are complete in all their appointments and there is power sufficient to work the mine to a depth at least of 1,500 feet. The mill has ten stamps of 700 pounds each, and the engine has power to work ten more when needed. The mill is being improved now and some improved machinery is being put in for saving gold and sulphurets. There is a National drill being used to sink the incline, which drill was some time since purchased by the company. The incline is now down 790 feet, or 90 feet below the 700-foot, or lowest level. On the south side of the shaft from the 700-foot level upward the rock has been worked out and according to the books of the former owners paid on an average \$30 per ton. There are three paying chutes in the mine, the one on the south side being the one which was worked out down to the 700-foot level. The middle chute is now on the north side of the shaft and is in the neighborhood of 220 feet in width. The North chute is over 50 feet in width. The middle chute has been worked partially out down as far as the 600-foot level. We saw some of the rock hoisted from this chute from a winze being sunk from the 700-foot level, while at the mine, which is the best we have seen in the district for years. It was heavily sulphureted and free gold just glistened through most of it. The ledge at the point from which it came is two feet in thickness and is composed of compact ledge matter. The shaft last night was down 800 feet, and from this point new drifts will be run north and south to open the south and middle chutes of ore. We are of the opinion that from this level up to where the ground has been worked out above, there will be gold enough extracted to go well toward paying for the property at its present valuation. On both sides the shaft and in all three chimeys the rock is looking splendidly. Miners who were employed in the mine formerly, say they never saw better looking ore come from it, and the width of the deposits are nearly double what they used to be nearer the surface. It will be remembered by old residents here that S. D. Merchant, while in charge of the mine took out 1,700 tons of ore which yielded in the aggregate \$102,000, being an average of \$60 per ton, and all the rock was taken out above the 400-foot level. Capt. White the present efficient Superintendent, is about to put in three improved concentrators which will dispense with a couple of men now employed to rock sulphurets, and below the mill he is having a huddle erected. He expects to employ a large number of men as soon as the incline reaches the 800-foot level, and will work the property for all it is worth. We feel confident in asserting that the mine is today one of the best in the county, and it affords us great pleasure in being able to make the assertion. We hope other San Francisco capitalists will be equally fortunate in their investments as the owners of the Pittsburg were when they made their purchase.

### The Greatest Mining Tunnel.

After 33 years of uninterrupted labor, the great undertaking of the Rothschoenberger water adit is so far completed as to admit of its use. Our readers are especially interested at the present time in enterprises of this kind, the approaching completion of the great Suto tunnel having called attention to the merits of this plan for working and draining deep mines. For the facts relating to the subject we are indebted to the *New York Stockholder*.

The method of draining the Frieberg mines by means of a deep tunnel had already been discussed in the beginning of the present century as a question of necessity for the future mining prosperity of the vicinity; and undoubtedly the Rothschoenberger tunnel is the greatest work of the kind that has ever been undertaken to aid the exploration of a mining district. Other great adits, such as those of the Hartz mountains, fade when compared with a tunnel which has already attained a length of more than 26 English miles, and will be with its branches when completed 31½ miles. The plan was to conduct the water from the Frieberg mines to the nearest practicable point on the river Elbe. Rothschoenberger, 12 kilometers above Meissen, was chosen as the most advantageous place for the mouth, on account of its having the lowest level at the shortest distance from Frieberg. The preliminary surveys were made in 1843, but the work was not thoroughly taken in hand until the third quarter of the year 1844. Since that time the driving of the tunnel has been unceasingly carried forward, but coupled with many hindrances and difficulties, such as quicksands, immense quantities of water, etc., which have trebled the cost and retarded its completion.

The tunnel is ventilated by eight air shafts, and lies some 400 feet below the deepest Frieberg water adit. It has a uniform height of 9.83 feet, with a somewhat similar breadth. The present length of the adit with its ramifications is 43,000 meters (all of which length is now in use) and will be when completed over 51,000 meters, or 31½ miles. The cost of the tunnel is estimated at 12,000,000 marks, or \$4,000,000, and will be paid by a tax on all mines which it directly benefits. The gradient of the floor is only 0.03m. in 100 meters. This small gradient may make it necessary to clear the tunnel occasionally, but this can be accomplished without difficulty with suitable boats and dredges. Five miles of this tunnel are perfectly straight, without the slightest curve, and along the whole length the curves are very light. One rather interesting occurrence during the past year was the striking of an old mine, of which no maps are in existence. This mine is probably more than four centuries old, and the timber which had been used as supports, etc., was found for the most part sound. Two new veins were also struck, but only one of them will be exploited. It is rather remarkable that nearly the whole driving of the tunnel has been done by hand, Burleigh drills driven by compressed air, having been introduced only within the past year. The rock throughout nearly the entire length is solid gneiss, which accounts for the great time that has been taken to the work, it being necessary with hand boring, to put in as many as from 40 to 50 holes to the face.

The necessity for the continued prosperity of the Frieberg mines, which have now been worked for about seven centuries, may be gathered from the fact that at the present time there are more than 6,000 laborers, with their families, amounting altogether to some 22,000 persons, who derive sustenance from the mines and metallurgical works connected with them. It may reasonably be expected that the Rothschoenberger tunnel will give fresh impetus to the Frieberg mining, and considerably augment the output of ore, which has of late years somewhat fallen off, owing to the immense quantities of water which continued to flood the mines, and prevented the veins of ore from being followed and worked below a certain depth.

**A WATER WHEEL AT WORK.**—A turbine wheel has been started up at the mouth of the Suto tunnel, which runs the machinery of the machine shop, the blower in the blacksmith shop and the printing press. The wheel is placed in the bottom of a shaft 60 feet in depth and is run with water from the tunnel. A tunnel from the bottom of the shaft carries away the water that has passed through the wheel. The wheel makes 1,000 revolutions per minute and has been christened the "Little Joker."

**ANOTHER LEDGE STRUCK.**—Friday last at 12 o'clock Maurice Hartnett and Alex. Fraser struck the Magnet ledge at a depth of 14 feet, and three and a half feet thick. It is a very rich vein of carbonate ore, assaying \$200 in gold and silver, and carrying 33% lead. This makes the third mine that has struck the ledge upon Prospect mountain during the past week, with rich and encouraging developments. *—Eureka Republican.*

**THE BRIDGE AT YUMA.**—The *Arizona Sentinel* states that the S. P. R. R. bridge over the Colorado river is 480 feet long, with a draw of 187 feet. Over 100,000 pounds of iron rods are used in bracing it together. Every span is an independent truss by itself. The piles are of cedar 14 inches square, and driven to a depth of 26 to 32 feet each. Experts say that there is no better wooden bridge in the United States.



## A Resuscitated Mining Camp.

A correspondent of the Gold Hill *News* writes as follows from Bodie district, Mono county: A trip to Bodie involves a deal of personal discomfort, annoying dust, heat and extreme cold, especially while passing through the Stillwater country.

Aurora bears many evidences of past prosperity in the shape of six or seven large brick buildings, costing all the way from \$30,000 to \$60,000, while quite a number of brick dwellings far superior to the houses of the same kind in Gold Hill are scattered around on the sides of the canyon in which the town is built. After a short stoppage we passed down the canyon in which were four or five large fine brick mills, erected at the cost of \$200,000 or \$300,000 each. Alone, silent and deserted they loom up, impassive relics of former prosperity and of the days when \$12,000,000 to \$14,000,000 were produced from the outlying hills around Aurora.

The road now turning abruptly to the left, the horses subsided into a slow walk and a weary climb commenced through a seemingly endless, winding canyon, through which a small stream wound its crawling course, crossing the road at almost every turn, while, on either hand rose the canyon sides covered with loose, float, rugged crappings, of a spotted hue, and therewith the common pine-needle trees of the country. As we continued the trees became scarcer, and the stream less and less until it became mere thread and at last rocks and trees ceased and the mountains became less steep. We came upon a small plateau just below the town of Bodie, while at our left, at the base of one of the largest hills, stood the Syndicate mill, in full operation.

Ascending still on an easy grade for a mile the town of Bodie was reached. It is situated on a level spot of ground, only very low hills joining its boundaries. To the east of the town stands Bodie hill, on which the principal mines are situated; the Standard, Bechtel, Syndicate and the Black Hawk mines. The relics of Governor Blasdel's mill, or rather the foundation, shows on what a good spot a mill could be placed, but when the stampede from here took place everybody lost faith. It would now be the most profitable one in the State, for the Standard mine alone is opened in such a manner that 100 stamps would not annoy it at all, except that the assayer would have a considerably larger amount of bullion to melt.

They play now a very mean trick on the road agents, by making the bars 120 pounds each, which makes them very awkward to handle, so that the stage robberies are not likely to be profitable.

**SKIDMORE'S TUNNEL.**—Our old friend W. A. Skidmore writes as follows to the *Mountain Messenger* about the natural tunnel in Plumas county, about which he has stood a good deal of chaffing by doubting acquaintances: "During a trip of observation through your county, two years since, while on the old trail between Downieville and Forest City, in company with Mr. Charles Hendel and Mr. Joseph Gibson, of Scales, our attention was attracted to a natural tunnel through a distant range to the northward, apparently near the Plumas line. The weather was clear, and from our point of observation we saw daylight through what appeared to be the apex of a distant range. I published in the *MINING AND SCIENTIFIC PRESS*, of San Francisco, a brief statement of this natural phenomenon. This has recently been the subject of some facetious remarks in your journal, resulting, probably, from the obtuseness of our friend Stokes, of the Exchange hotel, Grass Valley, who, on the occasion of your recent visit, got his ideas and "other things" slightly mixed, and could not tell the difference between a tunnel thirteen miles long and a tunnel thirteen miles distant from our point of observation, thereby impeaching the veracity of myself and Mr. Hendel. Apropos of this matter, permit me to reiterate the existence of this tunnel, and to designate its locality, as demonstrated by actual observation from the other end. It is situated near the apex of Eureka peak, Plumas county, at an altitude of 7,000 feet above the sea level. Like Mercurio's wound, it is neither as deep as a well, nor as wide as a church-door, but it will serve to redeem our reputation for veracity. If you don't believe it now, go and look in the other end of the tunnel, as I have done, or forever hold your peace."

**BONANZA MINES.**—The developments in these mines continue more and more a surprise as the bonanza itself is explored and developed. The *News* says there appears to be absolutely no end or boundary to it. Those mines have been most admirably managed, the Superintendent keeping his explorations at least two years ahead of his ore developments, and not waiting to work out one section of ore before finding more. There is so much ore in sight in those mines, and accumulated at the various mills that without increased milling facilities there is not work enough for the men employed in them, consequently quite a number are being discharged.

**RATHER CURIOUS.**—Some time since, says the Gold Hill *News*, when the pumps of both the Savage and Hale & Norcross mines were running at their best speed, accidents happened by which both pumps were stopped for a time. The pumps had no sooner stopped than the water not only ceased to rise, but actually went down three feet of its own accord.

## USEFUL INFORMATION.

## The Pearl Supply.

The results of the Ceylon pearl fishing carried on during the months of March and April of the present year, says the *British Trade Journal*, are reported to have been very satisfactory, the yield of oysters having been larger than in any season since 1855. The banks known as the South-East and East Cheval Pairs and the Modregam Paar were selected, after examination, as being in the best condition for fishing, and nearly 7,000,000 oysters were brought up in the 30 days on which diving was carried on. Active operations were interrupted by bad weather on two days only, and, although the government had given notice of only 15 days' fishing, the oysters were found to be so plentiful that the diving was continued for twice that length of time. Over 1,500 boats were engaged in the fishery, of which, however, only 130 were "diving" boats, and of these 100 were selected for the fishing, and sent out in two divisions of 50 each on alternate days. The anticipations of a poor season had restricted the attendance of divers, and as only about 50 of these appeared, they had to work every day, instead of, as usual, on alternate days. Only one-fourth of the oysters brought up go to the divers' share, the remaining three-fourths going to the government, and being sold day by day to the dealers and traders who attend the auctions from all parts of India, and even from China and other countries. The average rate realized was 36 rupees, or £3 12s per 1,000 oysters, and the total produce of the government share was about 190,000 rupees, or £19,000, or nearly double the estimated yield. The results of the fishery in 1874 was only 1,700,000 oysters. Silavaturai is the headquarters of the fishery, and 4,000 or 5,000 persons were brought to the village in connection with the fishery. The produce of pearls was very good, many large and valuable specimens having been found. The method adopted for obtaining the pearls is to place the oysters in a large vessel called a ballam, and allow them to remain there till the fish becomes putrid, when the shells are easily separated, and the mass being washed in water, the pearls fall out and are picked up. The excellent results of the late season's fishing are attributed to the measures adopted by the Ceylon government for periodically inspecting the beds or banks of oysters, and arranging for the fishing of those only which are found to be in a "ripe" state for fishing. A pearl bank may be either too young or too old to produce good pearls, and it is only by careful examination of the ground and a periodical selection of samples that the proper time for fishing can be ascertained. At present it is the custom for a bed to be fished only once in three years, and the Cheval Paar and Modregam Paar, the scene of this year's operations, will certainly not be fished again till 1880.

**CURIOUS MECHANISM.**—A monk of the Benedictine monastery, at Raigern, between Brunn and Vienna, has completed a mechanical curiosity in the shape of a self-moving terrestrial globe, 1.4 meters in diameter. A combination of wheels gives it a motion similar to that of the earth, and when once set going it will revolve for three weeks. At the north pole of the axis are dial plates, on which the days, months, etc., are indicated, and over these is a smaller globe, by means of which the motion of our planet round the sun is exhibited. The larger globe sets the smaller one in motion by the agency of 12 wheels. The construction of the mechanism took more than 10 years' patient application, and was only completed after numerous experiments. As regards geographical details, the map on the globe is carefully drawn, and shows all the latest discoveries. The steamer routes, railway, telegraph lines, heights of mountains and the depths of the ocean are all distinctly shown. By a somewhat odd conceit, the year in which the globe was begun (1866) can be ascertained by re-arrangement of certain letters of the Benedictines' motto inscribed on it: "In hoc, sicut in omnibus, glorificetur Deus." The maker of the globe is a self-taught mechanic and artist, who, during the past 30 years, has adorned the monastery with numerous examples of his skill and ingenuity.

**THE DUKE AND THE WORKMEN.**—The Duke of Bridgewater was fond of watching his men at work, and when they were boring for coal at Worsley, he attended every morning and looked on for a long time together. The men did not like to leave off work while he remained there, and they became so dissatisfied at having to work so long beyond the hour at which the bell rang, that Brindley had difficulty in getting a sufficient number of hands to continue the boring. On inquiry he found out the cause, and told the duke, who from that time made a point of walking off when the bell rang, returning when the men had resumed work, and remaining with them usually until six o'clock. He observed, however, that, though the men dropped work promptly as the bell rang when he was not by, they were not so punctual in resuming work. He asked to know the reason, and the men's excuse was that, though they could always hear the clock when it struck 12 they could not so readily hear it when it struck only one. On this the duke had the mechanism of the clock altered so as to make it strike 13 at one o'clock.

## Preventing Boiler Scale.

We read an essay by Stephen Roper in the *Iron Age*, and take therefrom a specific for the prevention of boiler incrustation, which is said to be the basis of many of the compounds largely sold for this purpose. Mr. Roper says: Hemlock, oak, logwood and mahogany sawdust are frequently used for the prevention of scales with very satisfactory results, as the tannic acid which these woods contain has a tendency to mix with the scale-forming ingredients, to render them more light and porous, and consequently to prevent them from forming in hard, solid masses. The sawdust and bark of these woods have no chemical action on the iron of the boilers, but only tend to preserve it. It is very common to find boilers, located on streams in the vicinity of saw mills, entirely free from scale. In fact, refuse logwood, mahogany or oak sawdust, sal soda, ash and yellow ochre form the base for nearly all the patent compounds and solutions now in use for preventing and removing scale from steam boilers, coloring matter being added for the purpose of preventing steam users and engineers from discovering the ingredients from which they are made.

The following recipe will be found to contain the ingredients most generally used for preventing the formation of scale, and may be relied upon as the most safe, simple and efficient remedy now in use: 100 pounds of refuse logwood, mahogany or oak sawdust; 20 pounds of sal soda; 10 pounds of yellow ochre. The sawdust to be dry, mixed with the sal soda and ochre, and ground in a burr mill to the consistency of shorts used as horse feed. It may then be introduced once a week, in seven-pound charges, the first five weeks, and five-pound charges once a week afterward. It may be introduced either through the safety valve or man-hole, or the same ingredients may be placed in a tank or cistern, covered with water and allowed to remain for 48 hours, when it may be allowed to percolate or filter down into barrels, and be introduced through the pump in quantities of about three gallons per day.

**BOILED EGGS.**—Hard boiled eggs have always been considered more difficult of digestion than soft boiled ones. The reason is this: the white of an egg is almost pure albumen. Now albumen coagulates with heat, and is not so readily acted on by gastric juice; so that much of it passes from the stomach undigested. Persons with vigorous digestion may manage a hard-boiled egg so as to extract most of the nourishment from it, if it be well masticated and mixed with other food. The yolk of the egg, however, is not rendered worse by hard boiling. Eggs boiled just four minutes leave the white part in a partly flocculent condition, more easily digested, and not so soft as to be offensive to any one. An egg may be cooked in water at a temperature of about 165° Fah. for 15 minutes and leave the yolk well cooked, but the white will not be rendered tough and hard to digest. Though more troublesome, this is a good way to cook an egg to render it easy of digestion as well as palatable. Persons whose palates will not tolerate a soft-boiled egg should have them poached and dropped on toast.—*Dr. Holbrook.*

**PURIFICATION OF WOOL.**—The process, patented some time ago, for the removal of straw, burrs, etc., from wool, by treatment to sulphuric acid, has been modified by Lise, as follows: The stuff is worked for one or two hours in a bath consisting of about 26 gallons of sulphuric acid, of three to six degrees, one pound alum, half pound salt and 750 grains borax. It is then treated in a centrifugal machine, and afterwards subjected to a temperature of 212° to 248°. For removal of the acid it is first washed with pure water for an hour and a half, then treated for two hours with fuller's earth, soda and lime, and finally washed for two hours with fresh water. As sulphuric acid can only be employed with uncolored cloths, or such as have been dyed with indigo, chloride of zinc and chloride of manganese diluted to six degrees are substituted with fabrics otherwise dyed.

## GOOD HEALTH.

## Don't Poison the Babies.

**EDITORS PRESS:**—There is among us a fashion still prevalent, a relic of the dark ages, in accordance with which, when a person dies from an infectious disease, the disaster is attributed to a "visitation from God." Alas! for the paganism of Christians! Even among those of us whose faith is placed in a God of love, who delights in the well-being of his creatures, there is a strange amount of ignorance as to the origin and prevention of diseases. In spite of our school children receiving instructions in all the "ologies," not one man or woman in a hundred seems to appreciate the necessity of keeping their premises sweet and wholesome, not one in a hundred knows the way to do so, simple and inexpensive as it is.

There is too much false modesty and too much false delicacy in our midst. Such necessary but unpleasant things as privies and cesspools must be spoken of in bated breath; their existence must, as far as possible, be ignored. A woman may see her children die from

Diphtheria, Typhus and Cholera, And hear their deaths attributed to the myste-

rious ways of Providence, when there is no mystery whatever in the case. The children were poisoned by the death-dealing miasma arising from the neighboring cesspools. In heart anguish she disinfects her house, fumigates, scrubs and scours, but the cesspool, which has received all the contagious excreta, is left to fester and rot and spread the contamination on all sides.

Here, in our county (and, no doubt, all over the State the thing is the same) are mothers, all terror stricken for the lives of their little ones, and no one comes forward to say boldly that it is to the filthy uncleanness of the whole community that these dire diseases are mainly due. Is it credible? Or is it creditable to our boasted civilization, that barely a town on this coast has any decent sewage arrangements or takes any precautionary measures against these man-bred demons of "zymotic" disease? The word "zymotic" speaks for itself. It means that which spreads from a ferment, as yeast spreads in dough. The ferment for these diseases works in the festering corruption of our cesspools and privies. The resulting miasma poisons the air, while the seepage poisons the water, and the

## Black Death

Seizes another victim and yet another. The remedy for all this is as simple as the diseases are dire. Some years since the Agricultural Department at Washington contained in their annual report an account of "Moule's Dry Earth System," of which Prof. Hilgard gave a *resumé* in your columns last year.

It simply consists in depositing a proper amount of dry pulverized earth into the privy everytime it is used. By this means human excreta are rendered innocuous and inoffensive. The privy may be kept as sweet as the parlor. Let public opinion force every man to adopt this system. Let every man worthy of the name at once clean out the cesspools attached to his premises, disinfect the night soil and have it hauled to the nearest farm. Then fill up the pit and introduce the dry-earth system. Finally, let him who neglects to take these measures understand that he is virtually as much an assassin as he who destroys his victim by the dagger or the bowl.

I have occasion to write strongly in this matter, having just lost a dearly-loved daughter by typhus fever, the miasma causing which entered her system from poisonous cesspools at a place and on a date which I could readily specify.

EDW. BERWICK.

Monterey, Cal.

## Drainage by Shrubbery.

Dr. S. P. Crawford writes to the Dixon, Solano county, *Tribune* some interesting statements concerning the value of trees and shrubs in the absorption of waters which otherwise would exhale miasma. We quote: "A free circulation of the water is the important desideratum in those places where it is confined beneath the surface. Plant trees and shrubbery of any growth whose roots run deep, in such localities, and those conditions will be broken up that develop malarial poison. It has long been known that the sun-flower (*Helianthus*) planted about places infected with malaria was a preventive of ague. Within the last few years the Australian gum (*Eucalyptus Globulus*) has been extensively planted in Florida and other Southern States to prevent malaria. It was supposed that the absorbing power of the former, and the neutralizing power of the aroma of the latter, rendered the poison inert. The true solution must be looked for, not in the absorbing or neutralizing power of the leaves, but in the roots.

The roots of these plants reach the water beneath, and ramify the soil with millions of capillary tubes which take up the water beneath, overcoming its inertia or stagnant condition, putting it in motion, by which it becomes pure, flows upward a living stream, to be thrown off by the leaves, taken up by the air and wafted away to some distant region to come down in the form of rain. It is estimated that a large forest tree will exhale or throw as much as eight barrels of water a day. If one tree can put in motion so much water, the quantity that each shrub, plant or blade of grass throws off must be immense. Plant grounds, then, not susceptible of drainage by pipes and ditches, and you have a system of drainage equal, if not better, than any other.

Surface water in pools, ponds or lakes, open to the sun and winds that agitate and evaporate it, do not cause disease, but, in fact, such conditions are often the sources of health, from the fact that such places absorb animalcule and deleterious gases from the air that arise from other sources. It is only on the margins of such bodies of water, where the banks are low and spongy, letting the water seep into them some distance from the main source, where it becomes confined, undergoes fermentation from the heat of the sun penetrating it, that disease is likely to arise. Planting trees and shrubbery in such localities, breaks up the conditions that give rise to poisonous emanations. The best system of drainage for our town, owing to its low condition, and there being no natural or artificial channels for waste water, is to plant shrubbery and trees in all places where waste water is thrown.



# MINING SCIENTIFIC PRESS

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Sale—Excelsior Silver Mining Co.

## The Week.

The past week has been a somewhat eventful  
one in this city on account of the various fail-  
ures. The Pioneer Land and Loan Bank fail-  
ure, or swindle rather, has brought great dis-  
tress to a number of depositors, many of them  
losing their all. Neither Duncan or Le Warne  
have been caught as yet. The failure of the  
Fidelity Savings Bank, was unimportant, as it  
had only started up and had had no chance to  
get depositors. This bank succumbed under an  
attachment of \$500 for the counters. The fail-  
ure of Cross & Co., the large commission house,  
with liabilities at \$600,000 was a surprise to  
all, but the firm will probably resume business  
again shortly. The firm have been in active  
business for over 30 years, and have done a  
large business, especially in the export of grain  
and importation of various kinds of merchan-  
dise from Europe. They are largely interested  
in leading mining properties on the Pacific  
coast, being treasurers and managers of quite  
a number of leading California mines, notably,  
Black Bear, Plumas, Eureka and others. They  
are also the treasurers of the Leeds mining com-  
pany. They are also the agents of the London  
Assurance Corporation of London, England,  
and the Western Assurance Company of To-  
ronto, Canada. The business of these com-  
panies will not be affected in any manner by their  
failure. They have three establishments, one  
each in Glasgow, Valparaiso and San Francisco.  
Another item of interest this week is the prac-  
tical close of the Nez Perces war, General Miles  
having cornered Joseph and compelled him to  
surrender.

## Making Locations.

Too great care cannot be exercised by miners  
in making locations with respect to properly  
marking the boundaries of the claims. Simply  
driving a small stake a few inches into the  
ground and writing a notice on a card in an in-  
definite manner, is not the right way to take up  
a claim, even if it has always been the custom.  
The law insists that certain requirements must  
be complied with. In the inquiry into the reg-  
ularity of the proceedings prior to the applica-  
tion for a patent, the location notice is one of  
the first papers demanding the supervision of  
the department. The Secretary of the Interior,  
in the case of the Prince of Wales lode, took  
occasion to remark upon the latitude allowed in  
the construction of such notices, and said: "It  
should be borne in mind that the discovery of  
lodes and the preparation of location notices for  
the same, are generally made by unlettered men,  
and it would be productive of great hardship,  
and, perhaps, generally result in an entire loss  
of their valuable discoveries, if they were held  
to technical accuracy in their notices of loca-  
tion. Accordingly, it has been uniformly held  
by the courts and the department that extreme  
liberality should be shown to these notices, and  
if they were sufficiently certain to put an honest  
inquirer in the way of ascertaining where the  
lode was, that was sufficient." Accordingly,  
many location notices, neither very certain nor  
regular in form, have been held sufficient by the  
Department, especially in the absence of ad-  
verse claims; but the construction given to these  
informal notices was generally in cases of loca-  
tion prior to the passage of the mining acts of  
Congress. Since these acts, there are certain  
requirements which must be complied with.

The Revised Statutes require that the loca-  
tion shall be so distinctly marked on the ground  
that its boundaries may be readily traced. This  
is a very important matter, and locators cannot  
exercise too much care in defining their loca-  
tions at the outset, inasmuch as the law re-  
quires that all records of mining locations made  
subsequent to May 10th, 1872, shall contain the  
names of the locators, the date of the location,  
and such a description of the claim or claims  
located, by reference to some natural object or  
permanent monument, as will identify the  
claim.

The statutes provide that no lode claim shall  
be recorded until after the discovery of a vein  
or lode within the limits of the ground claimed.  
The object of the provision is to prevent the  
encumbering of the district records with useless  
locations before any work has been done. The  
claimant should, therefore, prior to recording his  
claim, unless the vein can be traced on the  
surface, sink a shaft or run a tunnel and find  
something definite before locating blindly on  
the supposition that there is a vein there. He  
should determine, if possible, the general course  
of such vein in either direction from the point  
of discovery, by which direction he will be  
governed in marking his surface boundaries,  
and should give the course and distance as  
nearly as practicable from the discovery shaft  
to some permanent well-known object or objects,  
such, for instance, as stone monuments, blazed  
trees, the confluence of streams, points of inter-  
section of well-known gulches, ravines or roads,  
prominent buttes, hills, etc., which may be in  
the immediate vicinity, and which will serve to  
perpetuate and fix the locus of the claim and  
render it susceptible of identification from the  
description thereof given in the records of the  
district.

In addition to the foregoing the claimant  
should state the names of the adjoining claims,  
or, if none adjoining, the relative positions of  
the nearest claims; should drive a post or erect  
a monument of stone at each corner of his sur-  
face ground, and at the point of discovery, or  
discovery shaft, should fix a monument, post,  
stake, or board, upon which should be desig-  
nated the name of the lode, name or names of  
locators, number of feet claimed and in which  
direction from the point of discovery; it being  
essential that the location notice filed for record,  
in addition to the foregoing information, should  
state whether the entire claim of 1500 feet is  
taken on one side of the point of discovery, or  
whether it is partly on one side and partly on the  
other side, and in the latter case how many  
feet are claimed on each side.

Within a reasonable time, say 20 days after  
the location is marked on the ground, notice  
thereof, accurately describing the claim, should  
be filed for record with the recorder of the  
district, who will thereupon issue the certificate  
of location.

The importance of attending to these details  
in the matter of location, labor and expendi-  
ture, will be more readily perceived when it is  
understood that a failure to give the subject  
proper attention may invalidate the claim.

CURLEY and Mack, two well known miners of  
Deadwood City, returned from the Big Horn  
country Friday night. They report passing a  
large party of prospectors, probably Wustum's,  
which went out from the hills under the guid-  
ance of a man whose name cannot be ascertained,  
but who was known as Charley. He claimed to  
have diggings in Rotten Grass that would yield  
30 cents to the pan. Arriving at that place he  
confessed to the falsity of his statement, where-  
upon the irate miners hanged him to a tree. It  
is presumed that he was in the employ of the  
post-trader, and took the party out for the  
benefit of that individual.

## Hydraulic Mining.

We commence this week the publication of an  
extended article on hydraulic mining in Cali-  
fornia, by Ang. J. Bowie, Jr., of this city. The  
paper was read at a recent meeting of the  
American Institute of Mining Engineers, and  
has been revised and corrected for the MINING  
AND SCIENTIFIC PRESS by the author. It is a  
general treatise on hydraulic mining, covering  
the ground in a very thorough manner. The  
paper takes specially into consideration the  
working of ground with very light grades, and  
some of the examples go to show the minimum  
grade at which hydraulic mining can be carried  
on. For the sake of comparison, the heavy  
grades of some of the northern mines are given.  
The paper shows also, what has not been dem-  
onstrated before, the quantity of water required  
to move different amounts of gravel at varying  
grades. In fact it gives information concerning  
all the details of hydraulic mining, treating of  
all the questions of dams, sluices, flumes, iron  
pipe, etc.

The statistical matter which is incorporated  
in the paper is of the greatest importance and  
utility to the engineer and miner. Some of the  
tables giving the details of work of different  
hydraulic claims are especially interesting.  
They show the duration of the runs over a  
period of several years, the amount of gravel  
washed, water used, grade of sluices, height of  
hauls, water pressure, average yield per cubic  
yard and per inch of water, average cost per  
cubic yard and per inch of water, total cost of  
melting and refining, labor, blocks and lumber,  
water, material, etc.; relative cost of labor,  
blocks and lumber, water, etc.; cubic yards of  
gravel moved per inch of water; amount of  
amalgam saved, fineness and value of gold and  
silver, total amount of bullion, and all the dif-  
ferent details in connection with the work. As  
these tables refer to different claims worked  
under different conditions, they serve as a valu-  
able basis for comparison. The claims referred  
to have been selected as furnishing examples to  
show the workings of hydraulic claims with  
small pressure and with minimum grades, so  
that the figures given are important as showing  
the least practicable grade at which this sort of  
mining can be carried on. With minimum fig-  
ures calculations can be made which are much  
more reliable than those based on the results  
with heavy grades. These latter therefore give  
a starting point for engineers to work from.  
They are from the best authorities, and show  
the result of practical work.

The paper also gives the results of experi-  
ments with the burdy-gurdy wheel at North  
Bloomfield, constructed by Hamilton Smith, Jr.  
It gives, moreover, some very interesting infor-  
mation, hitherto unpublished, concerning iron  
pipes, proper weight of iron, rivets, etc. Facts  
concerning the distribution of gold in under-  
currents and sluices are detailed, as well as the  
methods of blasting, arrangement of compound  
current for large blasts; methods of construc-  
tion of flumes, ditches, etc., effect of different  
classes of powder, proper size of nozzles for ef-  
fective work, and, in fact, everything which  
may be of interest to the miner or engineer in  
connection with hydraulic mining. The article  
contains numerous illustrations, and has been  
written with great care, forming the most com-  
plete and exhaustive treatise on the subject yet  
written.

We should advise our friends interested in  
this branch of mining to file away the MINING  
AND SCIENTIFIC PRESS containing this article,  
for future reference. There is nothing like it  
in any of the books on mining, and the infor-  
mation given can be gained nowhere else. Mr.  
Bowie's reputation as a mining engineer is suf-  
ficient guarantee of the reliability of all the  
statements made, and his practical experience  
in this State has given him opportunities for  
obtaining information open to few. The data  
collected will be of the greatest value to engi-  
neers and to the mining community, as being  
the result of practical work extending over a  
period of years.

**BIG BULLION SHIPMENT.**—The *Enterprise* of  
the 7th says: "The Consolidated Virginia and  
California mines made another shipment of  
bullion last evening, consisting of 156 bars, val-  
ued at \$637,865.39. Of these Consolidated Vir-  
ginia shipped 69, valued at \$274,431.91, making  
a total of \$1,102,144.28. The California shipped  
87 bars, valued at \$363,433.48, making, with  
the shipments previously made, a total for the  
month of \$1,534,616.27. Of this amount \$743,-  
545.46 is gold and \$791,070.81 silver. The  
total of the California for September exceeds  
that for August by \$130,000. The bonanza  
mines have shipped, during the past week,  
\$1,156,914.91."

**INDIANS IN ARIZONA.**—Some uneasiness is ex-  
perienced at the present time with regard to the  
emigration of about 300 Warm Spring Indians from  
the San Carlos reservation, and already a num-  
ber of settlers have been killed on the upper  
Gila. Whether these Indians will continue to  
depredate upon the settlers, and perhaps be  
joined by other discontented Indians, depends  
very much upon the action of the military  
authorities.

THEY are now working about 30 white men  
and 50 Chinamen at the river claim, near Chile  
bar, and are taking out all the way from \$400  
to \$800 per day.

## Outside Districts.

With all due deference to the wonderful out-  
put of precious metals by the Comstock lode,  
it may as well be remembered, by those desiring  
to invest in mining operations, that there are  
plenty of other localities where money can be  
made. Of those who deal in mining stocks in  
this city, nine out of ten will not look at any-  
thing off the Comstock. They think that the  
only place on the coast worthy of attention,  
and put up their money accordingly. Probably  
this feeling was caused more by the transactions  
in Idaho stocks than anything else. A few  
years ago the Comstock, Pioche and Idaho  
stocks were pretty much all there was to deal  
in in the city market. Pioche didn't pan out  
as well as it might, and the outrageous action  
of the managers of the Idaho stocks brought  
them into disrepute. A great deal of money  
was lost in the Idaho mines, not so much by  
reason of the lack of ore in the mines as by the  
lack of honesty in their managers. People who  
invested in them—and they were many—became  
disgusted and made up their minds not to go  
"outside," which means outside the Comstock.  
This feeling has grown with all the California  
street miners, and until lately it has been ex-  
tremely difficult to get a cent on an outside  
piece of mining property. Now, however, a  
better feeling prevails to some extent, but the  
old prejudices still exist among the majority.  
Those new to the business, who are likely to  
form their impressions from persons of sup-  
posed experience, will be apt to make a mistake  
if they think the Comstock the only place  
worthy of attention by mining men. It is per-  
fectly true that that camp is the most extensive  
on the coast; there are more mines there, and  
the bullion product is greater than all  
the rest of the camps combined. But it must  
also be remembered that more money has been  
spent there than in all the rest of the camps  
combined, the developments are more exten-  
sive, and the occurrence of such bonanzas ex-  
ceptional.

It is with no intention of attempting to de-  
tract from the merits of the Comstock that we  
take occasion to remind people that there are  
plenty of other places where mining property  
will be likely to pay as well as there. Persons  
desirous of buying mines have a wide and  
varied field from which to choose. California,  
Nevada, Arizona, Montana, Utah, Idaho and  
Oregon have numberless camps in which are  
numberless mines or claims only partially pros-  
pected. In many cases good prospects may be  
bought for small amounts, or interests bought  
in well-developed properties. It is by no means  
necessary to form a stock company in order to  
work a mine, for as a general thing mines  
owned and managed by individuals are the most  
successful.

We notice with pleasure that several old, or  
new mining districts of Nevada are coming to  
the front and beginning to attract attention. It  
is not well for the interests of the mining com-  
munity to be centered in one locality. The more  
prosperous camps there are, however small,  
the better it will be and the more chance there  
will be for working miners. In the big camps  
the chance of employment depends on a dozen  
mines or superintendents, but where there are  
a number of small mines the authority is scat-  
tered. In California quartz mining is perhaps  
more prosperous than it has been for several  
years and many of the old districts are looking  
up again. Prospecting is the order of the day  
in the mountains of this State, and under the  
new order of things—easier transportation,  
cheapness of provisions and more economical  
views—quartz mines which were worthless  
eight or ten years ago are now valuable prop-  
erties.

The same may be said to be the case in the  
Territories, so that the chances for investment  
is not by any means confined to narrow bound-  
aries. There are plenty of mines to be bought  
and plenty more to be found, so that those in-  
tending to invest need not feel themselves  
bound to look to the Comstock as the only  
place where fortunes can be made in mining.

**THE MARIPOSA COMPANY.**—The New York  
*Tribune*, of October 8th, says: "It is understood  
that F. B. Wallace is to institute proceedings  
against some of the Directors of the Mariposa  
Land and Mining Company for \$30,000, alleged  
to have been illegally assessed, and also against  
Eugene Kelly for \$1,000,000 damages. Wallace  
says that the statement is premature, and that  
the facts in the case will not be ready for pub-  
lication for several days. Kelly states that upon  
his return from St. Louis, a few days ago, he  
received a letter from Wallace and others,  
requesting payment of the claim without the  
annoyance of a suit, and that his response was  
that he would not pay another dollar, having  
already settled the matter on which the claim  
is based. He adds: "Since my connection with  
the Mariposa company in 1868, I have met with  
nothing but trouble and annoyance. That con-  
nection was brought about by a loan of \$100,-  
000 in cash, to secure the payment of which I  
took a mortgage. Gentlemen at present in  
opposition to this company have lately brought  
suit in San Francisco, and a receiver has been  
appointed. They have already sued me three  
times, and I have been successful in each in-  
stance. When the present threatened suit is  
brought and charges published, I shall be ready  
to say something on the matter."



## Hydraulic Mining in California.\*

(By ACO. J. BOWIE, JR., A. B., Mining Engineer.)

## Brief Outline of the General Topography of the Gold Regions of California.

The topographical features of California, as demonstrated by the explorations of the State Geological Survey, are found to be exceedingly simple. Three equidistant parallel lines can be used in conveying a general idea of the physical geography of central California.

A straight or "main axial line," whose course would be north 31° west, passing through the culminating peaks of the Sierras for a distance of 500 miles, can be assumed as the western boundary of the State. A second parallel drawn 55 miles west of the "main axial line" will skirt the western base of the Sierra Nevada, along the edge of the foot-hills. A third parallel run equidistant from the second will represent, "as nearly as possible, the western base of the Coast ranges." These parallels divide the State into three belts, namely, the Sierra, the great Valley of California, and the Coast ranges.

"This arrangement of the physical features holds good for a length of 400 miles in the direction of the main axial line, comprising almost the whole of the agricultural and the greater part of the mining districts."<sup>†</sup>

The section of the country which is of immediate interest to the miner is the western slope of the Sierras. These mountains, rising in a short distance from the Sacramento plains to elevations of over 7,000 feet, with occasional peaks 10,000 and 12,000 feet high, are cut by numerous deep and precipitous gorges or canyons, through which drains the immense watershed of the Sierras, supplying the main rivers of the State, and ultimately emptying into the Pacific ocean.

Between these canyons, ridges or divides are formed, on top of which gold placers are found. These gold-bearing surface-deposits extend from Shasta in the north to Kern county in the south, the most extensive deposits occurring in Plumas, Sierra, Placer and Nevada counties. The term *shallow placers* is applied to deposits of gravel and earth whose thickness varies from a few inches to five or six feet in depth, to distinguish them from *deep placers* or detrital accumulations found in ancient channels covering large areas, and varying from 100 to several hundred feet in depth.

## The Discovery of the Gravel Deposits Containing the Precious Metal.

The pioneer miner, after working out the river bars, followed up the stream to find "the source of the gold." Its existence was discovered from slides, denudations, and breaks in channels, which subsequent explorations proved to be the ancient river system of the State, whose general course is nearly at right angles to the present river system of California.

The indefatigable prospector, advancing further into the unexplored mountains, again discovered gravel beds at elevations of several thousand feet above the present water-level. The streams flowing through the precipitous canyons of the high Sierras aided materially in the development and discovery of the gold fields. Their waters were soon appropriated for gold washing, and thus was inaugurated the system of mining ditches, which to-day extends over several thousand miles.

The immense gold-bearing drift inclosed between channel walls, or "rim rock," as it is called, was explored by means of tunnels driven in from bordering canyons, tapping the bottom of the deposit, enabling the extraction of the pay stratum, which was subsequently sluiced to extract the gold. This style of mining received the name of "deep placer mining."<sup>‡</sup>

Little by little the "top dirt" of these deposits, composed chiefly of light soil, clay, fine gravel, and streaks of sand, was washed off, and in places considerable gold was thus obtained. Canvas hose was brought into use to convey the water over the banks for washing the dirt, and from this originated hydraulic mining. In the progress of the work strata were found composed of boulders, pebbles, quartz, sand, and various rocks cemented together, requiring the use of powder to break them up. The color of this cement was in places white or reddish, and sometimes blue.

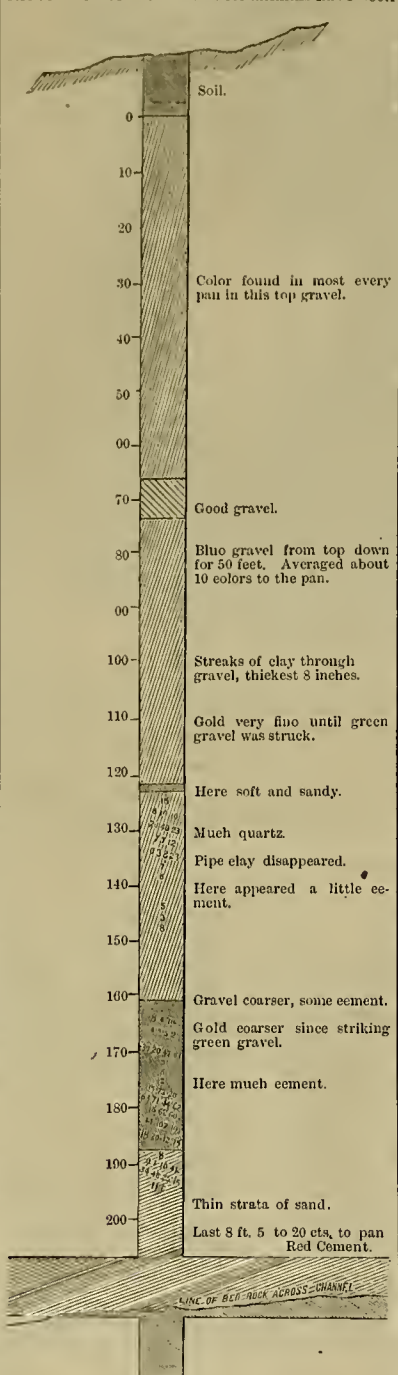
Shafts sunk in these strata discovered the presence of gold in great abundance, and a fresh enthusiasm was thus infused into gravel mining, already on the wane, as the river bars were becoming exhausted.

## The Gold Bearing Deposits of California.

The auriferous deposits of California are chiefly confined to the western slope of the Sierra Nevada mountains. The principal counties in which placer mining is carried on are: Shasta, Trinity, Plumas, Sierra, portions of the east side of Butte and Yuba counties, also Nevada, Placer, El Dorado, Amador, Calaveras, Tuolumne, Mariposa, and Stanislaus counties. "It is here," says Professor Whitney, "that the belt of metamorphic slates and sandstones, which is peculiarly the gold bearing formation of the State, is developed to its greatest width, and least concealed from the miners' explorations by the

presence of overlying non-metalliferous formations. It is here that the physical conditions have most favored the concentration of the gold in the detrital formation, so that it could be obtained by simple washing, without the necessity of mining for it in the solid rock, and perhaps more readily and more abundantly than any region ever opened to seekers after the precious metal."<sup>§</sup>

The gold deposits are found in river channels, in basins and on flats, also as isolated rolling hills, and occur either as accumulations of gravel alone, resting directly on the surface, or as accumulations of detritus, consisting of gravel, sand, drift, pebbles, and boulders of all sizes covered with lava and other volcanic products. Their geological ages are Post-Tertiary and Tertiary. Quantities of fossil wood and numerous remains of land and water animals have been



Figures within the shaft indicate the number of colors to the pan, every test made from 120 feet down is here recorded.

## Sketch of Shaft No. 1—Malakoff—North Bloomfield Gravel Mining Company.

found in the deposits, and are being constantly unearthed as the mines are worked.

The auriferous alluvions mark the lines of ancient rivers, whose action on a grand scale was analogous to that which can be daily seen along the streams which receive the tailings from the hydraulic claims now being worked. Volcanic eruptions have in places covered these deposits with lava and tufa, hundreds of feet deep. Denudation and erosion, the companions of time, have subsequently played their parts, and later in turn the product of volcanic activity has been overlain with gold bearing detritus.

These gravel channels are from a few hundred to several thousand feet wide, and range from the shallow placer to a drift 600 or 700 feet in depth. Their richness in gold varies in general, as well as in particular, in the many parts of the State.

Ferruginous-colored spots, so well marked in "upper or top gravel," are not always as pro-

ductive in gold here as they are generally found to be in the gold alluvia of the Ural mountains. A black sand, composed chiefly of glancing grains of magnetic iron, generally accompanies the precious metal, though it does not indicate its presence.

Dr. T. Sterry Hunt, speaking of the erroneous impressions which prevail in reference to the presence of black sand in auriferous alluvions, very appropriately remarks that "smaller black sand residues, consisting chiefly of various ores of iron (sometimes oxide of tin and other minerals), may be obtained from the washing of almost all sands and gravels derived from crystalline rocks, and that the occurrence of a black sand, therefore, in no way indicates the presence of gold. When, however, this metal is present in a gravel, it, from its great weight, remains behind with the black sand and dense matters in the residue after washing."<sup>¶</sup>

## The Distribution of Gold in Gravel Deposits.

It is not unfrequently stated that it is from the washing of the entire hanks that the gold is to be expected, it being disseminated throughout the whole deposit. That deposits are or are not auriferous for their entire depth will not be discussed; but that gold is proportionately diffused throughout the detritus, so that it could all be considered as "pay," is denied by experience and facts, as proven in California and other parts of the world.<sup>†</sup> It is owing to that circumstance that miners have coined the expression "pay dirt," which means that stratum or those strata which contain the bulk of the precious metal.

In some districts gold is found 30 to 50 feet above the bedrock in sufficiently paying quantities to hydraulic, and in some shallow banks gold is quite generally disseminated. Both at San Juan and North Bloomfield the gold is more or less scattered throughout the deep drift, and diggings near Forest Hill, Placer county, 20 to 60 feet above the bedrock, have yielded profits.

The top gravel of the channel deposit which passes through Columbia hill, Nevada county, has, in several instances, been successfully washed. This is especially remarkable on account of the great depth of this deposit, which, from the explorations on Badger hill and Grizzly hill, is inferred to be 600 to 620 feet deep. With such facilities as would be afforded by a heavy grade, sufficient dump and cheap water deposits of this character consisting of a fine light quartz wash, containing no boulders nor pipe clay, though they contained an insignificant amount of gold per cubic yard, could be successfully worked by the hydraulic method.

Experience has proved, however, that the quantity of gold found in "top gravel" is insufficient to warrant any large investment based solely on its value. Under exceptional conditions and circumstances the upper strata have, in some cases, yielded handsome returns, but on the whole the general results have been anything but fortunate.

It is a well established fact that the pay dirt is obtained, not from the washings of the entire hank, but chiefly from that stratum, or those strata which are in most cases within eight or ten feet of the bedrock. Where this is of slate upturned on its edges, the gold frequently penetrates it one or two feet. It also occurs in thin streaks of cemented gravel scattered here and there in the alluvial deposits, and not unfrequently a fine lamina gold is found in the grass roots.<sup>‡</sup>

This last mentioned circumstance is in no way localized, as similar facts have been noted in other countries. Mawe calls attention to the existence of gold in the grass roots on Mount San Antonio, in Brazil, and Walsh states that gold was first discovered in the deposits between S. Jose and S. Joas, Brazil, by Paulistas, who,

\* Geological Survey of Canada, Report of the Progress, 1863-66, p. 80.

† Deposits between Tagilish and Ekaterin, Die Lehre von den Erzlagern, Von Cotta, p. 556. See article on "Gold Deposits," by M. A. Selwyn, Geologist of Victoria, Quarterly Journal Geo. Soc., 1859, p. 583. See "Gold Deposits of Jaraguá," *Annales des Mines*, 1817, vol. ii, p. 202. See gold deposits of Santa Rita, Contagallo, and Minas Novas. *Geology and Physical Geography of Brazil*, Hartt, pp. 50, 51, 159, 160. See account of the gold fields of Yesso, "Mineral Wealth of Japan," Henry S. Munroe, E. M., *Transactions American Inst. Mining Engineers*, June, 1876. See *Engineering and Mining Journal*, December 24, 1876.

‡ See description of the auriferous deposits at Morse's and Growler's Creeks, *The Gold Fields and Mineral Districts of Victoria*, R. Brough Smyth, p. 84.

§ On the subject of the relative position of gold in deposits, see report of Mr. Stutchbury, Government Geologist of N. S. W. See *Die Lehre von den Erzlagern*, Von Cotta, vol. i, p. 101.

¶ See account of the gold deposits at Nation's gully, New gully, Never Mind spur, Beechwood district, also workings at Balaarat, *The Gold Fields and Mineral Districts of Victoria*, R. Brough Smyth, pp. 81, 82, 87, 131 and 173.

†† "Siluria," p. 456, vol. i., *Russia and Ural Mountains*; 481. "Diggings at the Soiman and Mine Murchison," also pp. 86, 100. "Gold Deposits in Woods Point District and Windlass Hill," *Gold Fields of Victoria*, R. Brough Smyth.

‡‡ In reference to the occurrence of gold, the following note, taken from the *Engineering and Mining Journal*, February 10th, 1877, p. 34, relative to the discovery of pay gold in the New South Wales has been chiefly derived from interesting Mr. C. S. Wilkinson, F. R. S., writes from the Geological Survey Office, Gulong, under date of November 25th, to the Mining Department, as follows: "During my examination of the Tallawang gold-field reserve, I observed the important fact that the gold found in tertiary alluvial deposits at the old Tallawang and Clouch's hills diggings has been chiefly derived from conglomerates in the local measure. These conglomerates are associated with beds of sandstone and shales containing the fossil plant of our coal measures, the *Glossopetris*. This is the first time that gold has been noticed to occur in payable quantity in the coal measures in the colony, and it is not unworthy of remark that we here possess one of the most ancient 'alluvial' deposits in the world."

†† Mawe's *Travels*, p. 264.

pulling tufts of grass, "found numerous particles of gold entangled in the roots."<sup>§</sup>

The gold alluvia found near and along the banks of the Tuolumne river, Stanislaus county, present some striking examples of the distribution of the precious metal. The pay dirt in the Chesnau claim is confined to within six feet of the bedrock, whilst in the Sicard claim, situated about 600 feet south of it and across a ravine, with banks from 20 to 40 feet high, the gold is more generally disseminated as long as there are no sand strata, but whenever the latter appear the pay is confined to near the bedrock.

Sir Roderick Murchison, describing the gold alluvia of the rich mine of Pesbanka, near Bogoslofsh, says: "Most of the gold has been extracted near the center of the detrital mass, whose maximum thickness is about seven feet, and which is clearly divisible, as elsewhere, into two parts, viz.: overlying clay and shingle, and auriferous sand beneath."

At Minas Novas, in the Province of Minas Geraes, Brazil, the "greater part" of the gold is in a deposit called cascalho, which adjoins the decomposed bedrock. The cascalho is a conglomerate, composed of rounded quartz pebbles of various sizes, which have been cemented together with ferric oxide. "To this conglomerate the search for precious metals has been chiefly confined. Over this gravel lies a mass of red drift, varying in thickness from a few inches to 50 feet."<sup>¶</sup>

The stratum of cascalho mined from the bed of the river Jigitonhoua, at the Mandagao diamond works consisted of the same material as that of the other gold districts of Brazil. Large conglomerate masses of rounded pebbles cemented together by ferric oxide, found on the bank of this stream, occasionally contained gold and diamonds. The gold extracted from the cement gravel at Caparatra, situated higher up the river, was accompanied by a great abundance of "black oxide of iron."<sup>§</sup>

In the Patrickville Light claim, Stanislaus county, Cal., the pay stratum is six or seven feet thick and adjoins the bedrock. The gold is concentrated in this gravel deposit as long as there are sand strata in the hank, but with their disappearance it becomes diffused throughout the detritus. Whilst working this claim a large hole in the bedrock 25 feet deep was bottomed. The hole was filled with gravel, but no pay was obtained. The pay stratum was found to be on a level with and a continuation of the pay stratum of the rest of the claim. On the other hand, at the Chesnau and French Hill claims, whenever these hollows are found, a large yield of gold is invariably obtained.

The experience of miners in the gold fields of Victoria has led to the conclusion that "in large auriferous rivers gold is always found on the bars or point, and not in the deep pools or bends." In substantiation of these facts are cited Reid's creek, Wool Sheel, Twist's Fall, or Yackandandah, near Oshorne's Flat, and Rowdy Flat; at each of these places large holes were cleaned out, and "only a few colors obtained, whilst shallow flats immediately below them were very rich."

At French Hill, Stanislaus county, where the bedrock was undulating, and in depressions found around a little hill, formed by a sudden rise in the bedrock, the gravel paid better than in any other portion of the claim. The gold fields south of Miask\*\* in the Ural mountains, present a similar case, all the undulating ground and depressions around conical hills being the most productive in gold. The bulk of the pay dirt in the cement gravel of Nevada county is within the first 30 feet of the bottom.

It was the result obtained by the North Bloomfield gravel mining company from washing three and a quarter millions cubic yards of top gravel (1870-74), yielding 2.9 cents per cubic yard, and leaving a profit of only \$2,232.84, that determined capitalists interested in these claims to investigate the question of the comparative values of the upper and lower gravel deposits.

\* Walsh's *Notices of Brazil*, 1838-1820, vol. ii, p. 122. "The silver mines of Potosi were discovered by a Spaniard, who, in ascending the mountain, seized a bush to assist him and, this giving way, he found the roots embossed with silver."

† *Russia and Ural Mountains*, vol. i, p. 482.

‡ *Geology and Physical Geography of Brazil*, Hartt, pp. 159-160.

§ Mawe's *Travels*, p. 222-7.

¶ *The Gold Fields and Mineral Districts of Victoria*, R. Brough Smyth, p. 134.

\*\* *Russia and Ural Mountains*, vol. i, p. 488.

THE COLORADO BRIDGE.—The decision of the Cabinet concerning the controversy between the Texas-Pacific and Southern-Pacific railways, as to the latter's bridge and road over the Colorado reservation, and is a manifest victory for the Central Pacific. It was based upon an argument that, although Congress alone has power to grant the right of way over public lands, yet it is neither the duty nor interest of military or civil power to interfere to preserve any improved means of access to a military reservation. The practical effect of the decision will be to give the California Company free permission indefinitely to run its trains over the bridge and across the reservation, as Congress is not at all likely to interfere.

TUSCARORA.—The Western Union Telegraph Company has completed its line to Tuscarora, Nev., making the distance from Elko by wire 44 miles. The distance by stage is 48 miles.

ARIZONA was visited by heavy showers of rain during the last of September.

\* A paper read before the American Institute of Mining Engineers, at the Wilkes-Barre meeting, May, 1877.

† See vol. i, p. 5, *Geological Survey of California*, J. D. Whitney, State Geologist.

‡ Deep placer mining is now carried on in those sections of the State where the rich deposits are covered with thick beds of lava, rendering hydraulic mining impracticable.



## The Big Bonanza.

The workings on the bonanza mines are on so extended a scale and of so intricate a nature that it is very questionable whether any one not particularly interested in the mines and the drifts, cross-cuts and winzes run and in the extent and development of the various stopes, can carry them all along from week to week and comprehend.

### The Important Developments

Which have been and are now being made. There are few, therefore, who know the reach of the ore bodies being opened up on the various levels or how far they have been traced. To do this would, indeed, require the reader to follow the work through a labyrinth of channels and to retain a vast amount of statistics, important, yet not readily remembered. It was with a view of making a summary of these statistics, in connection with the developments made, that the *Virginia Enterprise* reporter asked and obtained the permission of Col. Fair to make a descent into the mines and take a look at the work going on and the formations encountered. It was not expected, however, that all the levels of both mines could be visited and examined in a single day; besides, the space required to chronicle the whole would exceed the limits of a single issue.

**The 1650-Foot Level of the Con. Virginia.** Was the first portion of the big bonanza visited. The *Enterprise* says: The drop was made through the C. & C. shaft and the visit made under the guidance of W. H. Patton, Assistant Superintendent. The drift west was followed to its face. The developments from what was formerly considered the west wall of the ore body are important. After cutting through eight feet of porphyry a new and unexpected ore body was encountered. Then came 35 feet of ore and the drift penetrated porphyry again. This, however, continued from five to eight feet, when ore was again encountered. This is

### A Most Important Development.

And one which is becoming more so with every foot made in the ore body by the drift. Nor are the developments being made by the stopes, as they are being extended to the south on this level of much less interest. They have been extended 120 feet in what is known as the west ore body—i. e., west of the horse—and the ore is found to be widening gradually all the way. When first opened up this ore body was 42 feet wide; yesterday (the 30th ultimo) the stopes were about 50 feet in width. The importance to be attached to this development will be apparent when it is remembered that this ore body on the level above extended 200 feet further south than where the stopes on this level now are. These are what are mentioned as the west stopes, 1650-foot level.

### The East Stopes

On this level are also following the ore body south, and on the east side of the horse. They have been extended about the same distance as the west stopes, viz.: 120 feet, and are also widening and extending as they reach out in that direction. In other words, the horse which lies between the two ore bodies is gradually becoming narrower. Where cut through by the drift west on this level it was 32 feet in thickness. The ore bodies have widened out till, at the southern extremities of the stopes above mentioned, they are within 12 feet of each other. In other words, the horse has narrowed down 20 feet in a distance of 120 feet, and is at the point above mentioned but 12 feet wide. At this rate it will entirely disappear about 200 feet from the line of the drift.

### Into the California.

The distance from the drift on the 1650-foot level to the California line is about 30 feet, and the next point visited was the west stopes of the California mine on that level. The sill floors of the stopes are being extended northerly. They have been carried north of the line about 30 feet, and are there 42 feet in width, and the west wall of the ore body at that point has not yet been reached. A cross-cut (No. 2 west) has been started westerly from the lateral drift, and will be continued on in the same manner as the one in the Consolidated Virginia, to explore the ore body recently encountered as above, and which will certainly be found in the California, since the developments in the Consolidated Virginia are but about 30 feet south from the line between the two mines.

### The Ore

Opened up on this level is exceedingly rich and the extent of the ore bodies immense. For the purpose of opening them up a drift has been extended north through the horse, leaving the ore untouched on both sides. This was followed to where the branch drift from the C. & C. shaft intersects it, at the northern end of the horse, a distance of some 200 feet. At this point cross-cut No. 3 has been started west and is in ore 10 feet. Again the drift was followed north, and for a distance of 100 feet, to where cross-cut No. 4 has been run about 60 feet, and this is also all in fine ore, and the quality of that near the face was improving upon even the excellent deposit opened up nearer the lateral drift. These

Cross-cuts are all Penetrating Virgin Ground. And, as will be seen from the distances apart, are opening up a body of ore immense in extent and exceedingly rich in quality. And all this is in the west ore body on a single level, and yet there are those who talk of the California as an exhausted mine and hint of "no more dividends." These developments, and a look at the ore, make it still more mysterious why the stock of this

mine should be rated after that of Consolidated Virginia.

### An Eastern Ore Body

Is also opening up on this level most wonderfully. The first place visited was winze No. 3, which is being sunk in the ore body at the northern terminus of the horse, and is down 50 feet or such a matter, all the way in ore of a good quality. Here a hoisting engine has been placed to facilitate the work of sinking. This ore body is reaching off north and east to an unknown distance. The boundary of the bonanza as traced on the 1500 level was north, 54 degrees east, and the clay wall of the body here seems to have a very similar trend. What it may portend, and how far extend, remains to be seen.

### The 1600 Level

Was reached by the cage in the winze and again explorations began. Here the make of the ore body to the northeast has been more extensively traced by a drift following the clay. This drift has penetrated about 85 feet and is in ore all the way. This ore body gives every indication, however, as traced up, of uniting with the western ore body at some point further north. We then returned to No. 3 winze and examined the west ore body on this level. The ore body has been traced going northerly for some 400 feet and stopes are being raised at each end. The ore is very rich and exists in immense quantities. It is similar in kind to that below, and is

### Very Rich.

Being of that loose, soft, porous nature which is easily reduced and which crumbles to pieces when exposed to the air for any length of time. It has been followed by the stopes on this level east and west 120 feet, but not to its limit. It is no doubt the same ore body found above; but on this level an important fact is being rapidly ascertained, and that is that it makes further west and east than on the level above. How far it may extend is not known, as its limits have not been sufficiently traced to determine it.

### The Ore Body is Undefined

As yet, its extent not having been reached in either direction. It, however, at the northern end makes to the east, and will doubtless find a connection with the east ore body as it widens out on the 1650 level. On this level connection has been made with the Ophir shaft and the ventilation is perfect, as it is, in fact, all through the mine. From this point the connections were followed to No. 3 winze, the descent to the 1650 level made, and thence the C. & C. shaft sought through the north branch drift.

### Improvements at the C. & C. Shaft.

The double deckers are being successfully run at the C. & C. shaft, and by a single drop four cages of ore are loaded, hoisted and trundled off. The new English cable, of which mention was recently made, is in place and swings the cages with perfect safety.

The dressing rooms recently fitted up there are the finest on the lode. They are large and airy and conveniently furnished. The north one is fitted up for ladies and with all the needed appliances, including bath tub and hot and cold water. Between this and the office is the gents' room, similarly arranged and furnished, and has the additional advantage of the finest shower bath apartment, with hot and cold water, which there is on the Comstock.

A new changing room for the workmen has been fitted up under the carpenter's shop south of the shaft. The room is 60 by 60 and lighted by four large east windows. All around the room are places for hanging garments, with hooks attached, and across the room are six similar rows, and several others nearer the stove running part of the way across. In the center of the east side is a cylindrical stove, made like a steam boiler, which is six feet long and three feet across. To guard against fire, boiler iron has been put on the floor, covering a space 10 by 12 feet. A shower bath to occupy one corner is not yet in. There runs along the south side a large tank for washing clothes. The whole is capitally arranged and will be found most convenient.—*Enterprise*.

### Vigorous Prospecting.

The Pliocene company, on Galloway hill, says the *Mountain Messenger*, means business, and has started to prospect its ground in a manner worthy of emulation by all companies that are able. This company, under the management of Mr. Thurston, Supt., commenced boring for gravel in the early part of this summer by hand power. A six-inch hole was put down through hard lava boulders to a depth of 186 feet, when pipe clay was encountered. Up to this point it was found necessary to use the drill exclusively. Here the auger replaced the drill, and the bore was extended downwards through 54 feet of pipe clay. When this depth was reached it was found difficult to make much headway owing to the falling in of pieces of clay from the sides of the hole, and requiring nearly all the time to keep the shaft clear. Upon consultation and a report from the Superintendent it was decided to abandon further attempts to reach bedrock with the auger, and commence a shaft. The company has gone about this work in a manner that commands admiration. It has a 90-horse power engine on the way, and boilers capable of generating steam in excess of its requirements. A large boarding house, engine house and timber shed will be erected as soon as possible. A contract has been let for 500 cords of wood. The shaft has been commenced and will be about 6 by 13 in the clear, with three

compartments. (We are not sure that we are correct in regard to dimensions.) It will be timbered with 8 by 8, sawed stuff, which will certainly make a very fine and substantial curbing. About 50 feet of the shaft can be sunk without encountering water, and by the time this is completed it is expected that the steam hoisting and pumping machinery will be in place. If the winter storms will hold off long enough to enable them to get under cover, work will go steadily on through the winter. It is supposed that the shaft will be from 400 to 450 feet in depth, but this is approximation, in a great measure. We are glad to see mining capitalists turning their attention to our mines, for we feel certain that in no part of the State is there such an inviting field for investment.

### A New Quicksilver Saver.

An experiment is being tried, or rather is about to be tried, at the head of the blanket sluices of the Con. Virginia pan mill and near the C. & C. shaft, with a new machine for saving quicksilver and catching the valuable part of tailings. It consists of a modification of the old California shaking tables. The preparations for trying the process are on a small scale. A water wheel is being erected some four feet across. This is to turn two shakers which are each fitted up with eight small copper pans coated with quicksilver, and containing in each of their bottoms cast iron balls about as big as rifle bullets, which are also quicksilver-coated. In some of the pans these bullets are still united as cast, the string of them being long enough to reach across the bottoms of these pans. The water wheel is the motive power, bands running therefrom to small pulleys on each of the system of shakers with their eight pans. The water is taken from the flume above at a point where it raises over the C. & C. side track, as is also the silt for the experiment. While the former turns the wheel and shakes the pan, it also helps to carry the latter down into the pans, which are arranged in perpendicular rows of four each. The agitation over the quicksilver surfaces of the balls and the pans, as the tailings pass through from pan to pan, serves to collect the particles of quicksilver as well as to amalgamate the mineral which is contained therein, and the valuable portion is thus collected and saved.

The "institution" is under the patronage of Dr. Cachot, of San Francisco, who is on hand to try the experiment. The "baby machine" will doubtless work tolerably well, but it seems as if there must be some wear and tear to a big one of the kind, and a big machine will be needed here if any.—*Virginia Enterprise*.

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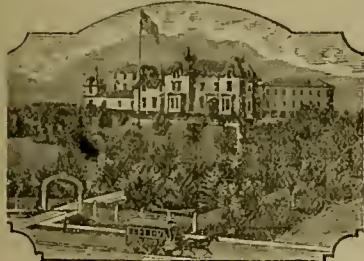


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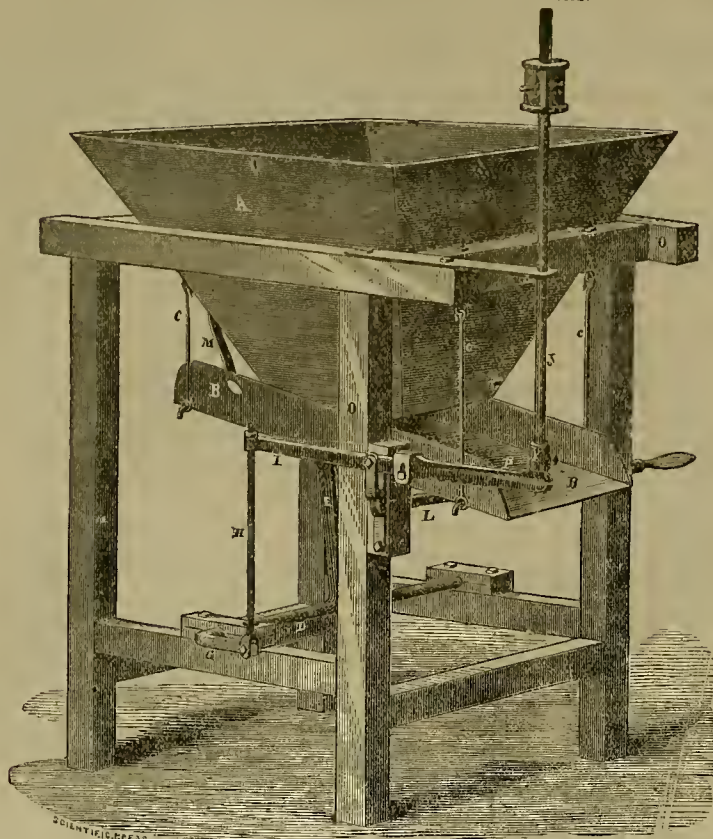
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Extract from a letter from C. G. Rodgers, Superintendent Green Mountain Mining Co., Plumas County, September 10th, 1877: After using both the Tulloch and Hendy Ore Feeders, side by side, for eight months, I can candidly say, that in my opinion, the Tulloch is much the best machine; it will feed any ore that can be fed by machinery; there is nothing about it to wear out, and should anything break, any blacksmith can repair it. Whereas, the Hendy machine is wearing from the moment it is started, and when any thing is worn out, or broken, you must have a machine shop or foundry to make the repairs. The Hendy Feeders are not in use at the Gold Stripe Mill; they were thrown out after a fair trial of some two weeks.

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TO HYDRAULIC MINERS.

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Several first premiums received for Quartz Mill Screens, and Perforated Sheet Metals of every description. I would call special attention to my SLAT CUT and SLIT PUNCHED SCREENS, which are attracting much attention and giving universal satisfaction. This is the only establishment on the coast devoted exclusively to the manufacture of Screens. Mill owners using Battery Screens extensively can contract for large supplies at favorable rates. Orders solicited and promptly attended to.

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The undersigned, owners of LESCHOT'S PATENT for DIAMOND POINTED DRILLS, now brought to the highest state of perfection, are prepared to fill orders for the IMPROVED PROSPECTING AND TUNNELING DRILLS, with or without power, at short notice, and at reduced prices. Abundant testimony furnished of the great economy and successful working of numerous machines in operation in the quartz and gravel mines on this coast. Circulars forwarded, and full information given upon application.

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100,000 ACRES OF SUGAR PINE,  
 Yellow Pine, Spruce, Fir and  
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10 Saw Mills, 3 Planing Mills, 1 Sash  
 and Door Factory,

149 Miles V Flumes, 10 Miles of Tramways  
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 and 550 Oxen and Horses.

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Last year thirty millions of feet were cut and the estimate for 1877 is fifty millions; fifteen millions are now on hand, thoroughly seasoned by the hot climate of Red Bluff and Chico.

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 San Francisco.



(Continued from page 229.)

All the water has been pumped out and the men are busy sinking on the ledge. Reports from the Doyle say that everything is looking well. Dan McCasker is down 60 feet on the ledge, and is taking out ore which he claims will assay up in the thousands. We learn that the purchasers of the Tip-top mine are intending to levy an assessment of \$100,000, with which to develop their property. The new gold mill at Walnut grove has been completed by Mr. Hoefler, and is now running on ore from the various leads in the neighborhood. Frederick's mill is again running. P. A. Craigue is in town from the Bradshaw country. Mr. Craigue reports that the water has been entirely taken out of the Tiger mine, and the main shaft is now in 12 feet of good ore and no wall found yet. There are now 15 men at work on the original location of the Tiger mine. The Eastern parties for whom P. A. Craigue bonded the great Sexton mine, in Weaver district, have concluded to buy the mine and at once erect a 20-stamp mill. The Black Warrior mine is improving in richness and size as the work progresses. The Goodwin is now down over 150 feet, and the ore richer and in larger quantities than ever. Negotiations are pending for the purchase of the California mine on the Tiger lode. From Greenwood, we hear that things are very lively and that the Signal mill will start in two or three days.

**BLACK WARRIOR.**—*Arizona Miner*, Sept. 23: The original locators of the Black Warrior mine have entered into a contract with N. Ellis and associates to prospect this mammoth lead, until \$10,000 shall have been expended, when should they be satisfied with the mine, they have the privilege of paying \$20,000 more and receive a deed to one-half of the same. The Tip-top company have disposed of their mine, in Humboldt district, to Hoffman, Gillett & DeGrano, for \$50,000 cash, and, as these gentlemen are all mining experts, it is generally supposed that they knew what they were purchasing.

The Peck company are still working their well-defined and prospected bonanza and are now shipping over \$50,000 per month, giving employment to over 150 persons. Their new mill will soon be erected at the mine.

The Tiger, in Bradshaw, is undergoing a thorough test through the skill and management of Mr. Helm, who is obligated with the owners to expend, in prospecting this old favorite lead, \$10,000, when, should everything prove satisfactory, a purchase will undoubtedly be made. In Turkey creek, Matterson & Co. are prospecting their various leads with energy and great faith, grading roads and excavating a site for their new mill, which will soon arrive on the ground.

Near Walnut grove, Mr. Hoefler has just completed his new gold mill, which is running steadily on ore from the numerous leads in that vicinity.

Fredericks has once more started up his Senator mill, with new and improved machinery, having hundreds of tons of good ore on the dump, and we expect to hear of financial success from that quarter.

The Black Warrior, Tip-top, Cross-out, Peck, Tiger, Turkey Creek, Walnut Grove, Senator and other mines and enterprises, such as building the road to Bradshaw and our new county buildings, wherein nearly \$100,000 is to be expended. All have a tendency to make money easy.

## Idaho.

**MINING NOTES.**—*Owyhee Avalanche*, Oct. 6: Report from the various mining districts of the Territory have been gradually improving during the past few weeks, and the indications are that the coming winter will witness a much greater degree of prosperity than that which marked the progress of operations last winter. In this immediate vicinity the outlook has greatly improved since the beginning of the fall months, and the change seems to be based on real, substantial progress. As an evidence of this it gives us pleasure to state that the shipments of bullion from this camp within the past four weeks have amounted to within a trifle of \$40,000; not an immense sum it is true, and a very small proportion of what it would be if our incorporated mines were all in full blast. It shows, however, a decided improvement in business, and it looks now as if it would grow better from this time forward.

At the Golden Chariot the work of sinking is progressing favorably. Work is now going on at a considerable depth below the 14th level.

At the Empire some inconvenience has been experienced from a flow of water near the 8th level. All the indications point to the existence of an immense bonanza in that direction.

We are gratified at being able to state that the outlook for the Poorman is quite favorable.

THERE are upwards of 20 men at work on the Black Jack mine, Florida mountain, and from seven to ten tons of rock are being daily taken out.

A CRUSHING of 35 tons of Illinois Central rock yielded a bar valued at over \$14,000.

## Oregon.

**THOSE SOAP HOLES.**—*Willamette Farmer*, Oct. 6: Parties just over from Primeville inform us that the people there have now more confidence in the "soap holes" than ever before. The companies owning the machinery which was lately taken over there, lost confidence in the man that was superintending their work and discharged him. Prof. Hurley has been put in charge of the mill and is getting everything ready for a run. A ditch is being constructed to carry water to the mill from Camp creek for the purpose of washing away the tailings. As soon as it is completed, and some other minor improvements made, the mill will be started up.

**COAL.**—*Oregonian*, Oct. 6: At Henryville mine, Coos bay, there is a block of coal eight feet long, two feet wide and two feet thick.

It is said that the workmen of the Tellurium mine in Douglas have struck \$1,500 rock.

**WATER WANTED.**—*Jacksonville Times*, Oct. 6: The richest ground in Jackson county will never be washed until 15,000 or 20,000 inches of water are brought on the divide between Bear Creek valley and Applegate. It can be done, and more money than it would take to do it has been expended in much less certain enterprises in California and Baker county, Oregon.

**BULLION SHIPMENTS.**—Since our last issue shipments of bullion from prominent mines have been as follows: Northern Belle, Oct. 3d, \$9,436.04; Arizona, 3d, \$1,104; Endowment, 6th, \$2,502; Arizona, 7th, \$895.54; Alps, 3d, \$5,924; Northern Belle, 4th, \$6,618; California, 6th, \$363,433—total for September, \$1,534,516; Con. Virginia, 6th, \$274,431—total to date, \$1,102,144; Leopard, 9th, \$3,300.

**THE Calaveras Chronicle** of October 6th says: Several miners' cabins were destroyed by fire at the Gwin mine, at Mokelumne Hill, last Monday night. The fire originated in the cabin occupied by Newman and Haupt, totally destroying the building and its contents, the boys being at work in the mine at the time. The flames were communicated to a number of other cabins, which were hurried.

**THE President** of the Pennsylvania coal company and the Delaware and Hudson coal company, and the General Agent of the Delaware and Lackawanna company, have had a conference with their striking miners. The miners receded from their demands of 25% advance, but the officers declined any negotiations pending the strike.

## PATENTS AND INVENTIONS.

### List of U. S. Patents Issued to Pacific Coast Inventors.

(FROM OFFICIAL REPORTS FOR THE MINING AND SCIENTIFIC PRESS, DEWEY & CO., PUBLISHERS AND U. S. AND FOREIGN PATENT AGENTS.)

By Special Dispatch from Washington, D. C.

WEEK ENDING SEPTEMBER 18TH, 1874.

**HORSE-POWERS.**—Thomas C. Churchman, Sacramento, Cal.

**WHEEL PLOWS.**—Stephen M. Harris, Forest Grove, Oregon.

**CARPET SEWING MACHINES.**—Joseph Hess, S. F.

**PNEUMATIC DREDGING TUBES.**—William P. Lewis, Oroville, Cal.

**ENDLESS ROPE TRACTION RAILWAYS.**—Asa E. Hovey, S. F.

**BOOTS AND SHOES.**—George Steinhilber, S. F.

RE-ISSUES.

**RELIEF VALVES FOR WATER CYLINDERS.**—Charles E. Blake, S. F.

**FIRE ALARM TELEGRAPH REGISTERS.**—Daniel F. Phelps and Charles W. Edmunds, S. F.

WEEK ENDING SEPTEMBER 27TH, 1877.

**GANG PLOWS.**—Daniel Funk, Harrisburg, Oregon.

**GRAINING DEVICES FOR TRACTION CARRIAGES FOR PROPPELLING CARS AND VEHICLES.**—Charles A. Gustafson, S. F.

**ENDLESS ROPE TRACTION RAILWAYS.**—Andrew S. Hallidie.

**SOFA BEDSTEADS.**—August Hansen, S. F.

**PACKING CIGARS.**—John W. Shaeffer, S. F.

**KITCHEN TABLES.**—Leon M. Bowdoin, Nevada City, Cal.

**SAW MILL SET WORKS.**—James A. Robb, S. F.

**HORSE COLLARS.**—Adam Rutherford, Walla Walla, W. T.

**COIN WRAPPERS.**—Roger L. Ryan, S. F.

—The patents are not ready for delivery by the Patent Office until some 14 days after the date of issue.

**NOTE.**—Copies of U. S. and Foreign Patents furnished by DEWEY & CO., in the shortest time possible (by telegraph or otherwise) at the lowest rates. All patent business for Pacific coast inventors transacted with perfect security and in the shortest possible time.

### Notices of Recent Patents.

Among the patents recently obtained through Dewey & Co.'s SCIENTIFIC PRESS American and Foreign Patent Agency, the following are worthy of mention:

**PROJECTILE FOR CANNONS.**—Joseph R. N. Owen, Hamilton, White Pine county, Nev. This is an elongated projectile for smooth-bore cannon, and is designated the "Feather Bolt" shot or shell. The improvement is in the construction of the projectile itself, by which is secured an accurate and steady flight throughout its range, when fired from smooth-bore guns; and the certain maintenance of its long axis in a position tangential to the line of trajectory at all points of its flight, without the usual spinning motion of a rifle projectile. It relates also to certain fittings essential in adapting the shot to the conditions and requirements to which it is subjected within the bore of the gun, and while being driven by the expanding powder gases, but which are stripped from it when beyond the influence of the latter. The projectile may be made solid or hollow, and should be made of the best oil-tempered steel. Upon the basis of an assumption which contravenes the generally accepted theory upon the subject, but which is, the inventor claims, nevertheless, positively sustained by experiment, and by many well-known facts, that the powder gases continue to exert a very important influence upon the projectile even for some distance beyond the muzzle of the gun, in determining its velocity and range. The "Feather Bolt" is provided with a strong metallic shoe or sabot made of tough wrought iron. This is a thick, circular disk with a counter-sink in the center to receive the point of the shot. It is claimed that this projectile will deliver its blow end on and in the line of trajectory, whether fired at high or low elevation, or at long or short range. This would remove all objections to the use of the much desired percussion fuse.

**METHOD OF PACKING CIGARS.**—J. W. Shaeffer, S. F. This invention relates to a novel method of packing cigars in boxes, so that the cigars are preserved in better condition than when packed in the ordinary manner and the box is more compact and symmetrical. In the ordinary method of packing cigars they soon become very dry, and especially so at the finished tips, so that when the smoker bites this off the wrappers are apt to become broken, so that it will not draw well, and the user is annoyed by fine particles of tobacco coming off. In this method the box is made long enough to receive two cigars in length when their ends slightly overlap. The cigars are made into two bundles of 25 each, and these are placed with their ends meeting, which holds them in place and keeps the ends from drying.

**ANKLE BOOTS.**—Geo. C. Steinhilber, S. F. This invention relates to a novel construction for hoots and shoes, which is called a folding ankle hoot. It consists in forming the portion which surrounds the ankle in one piece, and of sufficient width to allow easy ingress or egress for the foot. This ankle piece has folds upon each side, so that when the boot is on the foot it may be drawn close against the ankle, and secured by a single strap and buckle at the rear. This forms a neat and expeditious method of securing ankle boots without the use of any buttons, strings or other fastening except a single strap, and without making any openings in the sides or front.

**WOOD GRAINING MACHINE.**—Wm. O'Day, S. F. The invention relates to an improved machine for graining boards which have been planed and painted, or otherwise prepared for graining in the lough piece. A graining roller and impression roller are mounted on a suitable frame. The graining roller is made frequently of metal, upon which the desired graining pattern is engraved or otherwise delineated; the impression roller possesses a soft, elastic surface like the roller of a printing press. These rollers are mounted horizontally across the frame so that their faces are pressed slightly together. The lower part of the graining machine rotates in a tray of paint, so that it continually supplies itself with paint. A flexible scraper is mounted at an angle to the outside face of the graining roller so as to press against it. As the inked surface leaves the tray it is scraped to allow the surplus paint to run back to the tray, leaving the pattern filled. It then rolls in contact with the yielding surface of the impression roller, which takes the paint from the graining roller and imprints it on the board which is passed under it in contact with its lower side. Suitable gearing is provided for feeding the boards to the rollers. By means of this machine boards may be grained with great celerity, as it is only necessary to run them beneath the rollers while the machine is in operation. A number of rollers with different graining patterns engraved on them, can be kept on hand so that a variety of work can be done.

**GRIPPER.**—Chas. A. Gustafson, S. F. The invention is an improved gripping device for connecting a car or other vehicle with an endless moving rope or cable which is arranged to travel in an underground tube or tunnel for propelling the car or vehicle along a track or roadway. The improved gripper can either to operate by a lever or screw, and it consists of a permanent jaw which forms a part of the framework of the gripper and two movable lever jaws, which are operated by a vertically moving slide and the lever or screw referred to. Pulleys are provided for sustaining the moving rope when the permanent jaws release it.

**WATER CLOSET.**—John R. Adams, Oakland. The patent covers certain improvements in water closets and consists mainly in a novel method of banging and operating the pans so that the inventor does away with the space usually needed for the operation of the pan, and makes the apparatus more compact. It also relates to a method for leading all waste water from leakage into the pan. The operating devices are also simplified.

**SOFA AND BEDSTEAD.**—August Hansen, S. F. This is a novel construction of sofa beds. It consists in so constructing a sofa that it may be opened out to form a complete bed of which the back of the sofa forms the head-board. The details would be difficult to describe without a lettered engraving.

### Science in America.

As a general thing work partaking of a scientific nature is better appreciated abroad than it is by the public at home, and our scientists look to recognition from foreign countries before they begin to expect it from their own countrymen. The reason probably is that in the older countries they appreciate better the value of the results of scientific research than is done here, although we are happy to say that this is being rapidly remedied in the United States, and more interest is now felt in scientific matters than formerly.

We are here a very busy people. The country is young, and most of the population are hard at work trying to make their fortunes. Property is not handed down from father to son, as is so generally done in the older countries, so that when the young man comes of age he has a ready made fortune to step into; but each one, as he grows to maturity, must start in and carve his own way. Accordingly there is less opportunity for men to devote their lives to scientific pursuits than there is where they have plenty of time and money.

Again, in the older countries there are museums, and collections and schools especially to aid scientific students in their work, and almost every little town has its association or academy, where scientific subjects are discussed. Here such things are confined entirely to the larger cities, and the public educational funds are devoted mainly to the support of the public schools. The consequence is that in Europe there are many more persons interested in scientific pursuits than among us.

A love for science, however, is now more noticeable among the masses than formerly, as is also an appreciation of scientific work. In our colleges and advanced schools the scientific course is more sought for than it was. In the commoner walks of life there is more need for accurate knowledge than there used to be, and skill in almost any branch depends, to a great extent, on acquaintance with the scientific principles involved in the work. Accordingly, men know that to be successful they must not only be familiar with what is to be done, but know the reasons therefor.

In the United States there are very many

journals devoted to scientific matters, which are doing much to educate the masses to an appreciation of the value of scientific knowledge. The MINING AND SCIENTIFIC PRESS is proud to be one of these, and to have done its share in the good work on this coast. The public are learning to appreciate the fact that the application of scientific discoveries to the wants of everyday life have been productive of much good, and that science is not, as used to be supposed, simply the art of discovering and naming new insects, shells, flowers or minerals, but is something of practical utility, attaining results which are applied for the benefit of mankind generally.

### The Savings Bank Failure.

The failure of the Pioneer Land and Loan Bank of Savings, which occurred this week, is another illustration of the fallacy of entrusting money to the care of corporations which offer higher rates of interest than are current. The trouble is that poor people naturally want to get as high a rate, as possible for their savings, and handsome buildings and offices, polite officials and high rates of interest attract them irresistibly. The consequence is a large number of depositors with a few thousands each, go to such places and give the managers opportunities for their being not available in any other way.

Duncan, the manager of this bank, seems to have had the entire management and control. The President was a figure head, and confesses he had no power whatever and knew nothing of the business. Le Warne, the son-in-law of Duncan, was Secretary of the Safe Deposit Company. He "raised" the certificates of stock of this company and Duncan disposed of them. Besides the thieves in this direction, the losses of depositors are estimated at \$1,000,000. Duncan and Le Warne have disappeared with their ill-gotten gains, and as yet no trace of them has been found. The Fidelity Savings Bank, which depended to some extent on the Pioneer, had only been running 10 days, and was closed by an attachment for \$500 on the furniture, but it had nothing to lose, and the failure shows on what a flimsy basis such institutions may be founded.

The difficulty of such failures or swindles is, that they cause not only distress to those immediately concerned, but loss of confidence in all such institutions. The depositors have no protection whatever against the dishonesty of the officers. Money is put into such institutions in the care of men personally unknown to the depositor, and implicit confidence must be placed in their honesty. It looks as if our financiers might devise some plan for the better protection of depositors in savings banks, so that these failures should not occur so often. Of course there are sound banks and honest officials, and it is to the credit of the other banks in the city to know that none of them have had any dealings with the Pioneer for some time, as their managers were confident that the high rate of interest paid was not compatible with honest management. Altogether the affair is a very unfortunate one, and throws discredit on the city.

**COMSTOCK PAY-ROLL.**—For the month of September the principal mines on the Comstock paid out the following amounts to the miners: Sierra Nevada, \$11,800; Ophir, \$14,842.50; Mexican, \$2,556; Union Con., \$1,522; Savage, \$12,221.88; Hale & Norcross, \$6,469.25; Chollar-Potosi, \$10,254.50; Chollar-Savage-Norcross shaft, \$7,011.25; Overman, \$10,112.25; Caledonia, \$6,450; Crown Point, \$9,546; Yellow Jacket, new works, \$13,886.25; Yellow Jacket, old works, \$6,106; Belcher, \$12,198; Belcher-Crown Point air shaft, \$5,622.50; Con. Virginia, California and C. & C. shaft, \$141,871.25.

**THE ore dumps** at the Jackson, just finished, received their first load of ore yesterday morning, says the *Eureka Sentinel* of October 3d, and it is calculated that they will be filled by Thursday next, when shipping to the Richmond furnaces will begin. Smelting operations will commence Saturday morning, and the Jackson mine will wheel into rank as a bullion producer.

**THE South Comstock** company have steamed up again after having been shut down for some months. Their main shaft is 500 feet in depth. When they shut down there was 30 feet of water in the shaft; now it is found to be perfectly dry. The South Comstock is situated just south of the Silver Hill, the deep shaft of which has not only drained it but has also drained most of the other small shafts in that vicinity.

**THE Stonewall Jackson** mine in Arizona, recently sold to capitalists in this city, brought \$120,000 cash. This was about six weeks since, and the new miners have, it is said, taken out enough already to reimburse them, while sinking the shaft. The vein is only from four to six inches thick, but is very rich.

**ALL obstructive** regulations will be waived and American articles admitted to the French exposition on the simple introduction of our Minister Plenipotentiary. Legislation by Congress is, therefore, unnecessary.

**WOODWARD'S GARDENS** has the following new attractions: The buffalo chase; large whale skeleton; new museum; improvements in the zoological department, besides the other features which have made it popular.



Mechanics' Institute Awards.

The following additional awards have been made by the Committees of the Twelfth Industrial Exhibition since our list was published:

CLASS 42.—Samuel Kellett, plaster ornaments; M. Doyle, bust; Thos. Gagliardi, display of plaster busts; J. Grunzel, display of amber work; L. Schumann, display of meerschaum work.

CLASS 37.—Guido Kustel, galvanizing of animal and vegetable products.

CLASS 13.—W. Renuie, Boynton's tile parlor stoves; St. Louis Stamping Company, exhibited by J. B. Stotson, display of granite ware.

CLASS 15.—Jost & Vanlaere, mantels and California onyx; W. C. Campbell, Scotch granite monument.

CLASS 32.—J. Horzog & Co., Eureka hair.

CLASS 33.—Alexander Mackay, cocoa matting; California Silk Manufacturing Company, sewing silk and twist.

CLASS 35.—Miss K. L. Cole, paper patterns.

CLASS 25.—Rutherford & Mitchell, automatic reachers.

CLASS 21.—Kohler, Chase & Co., display of wind instruments; Paillard & Co., display of musical boxes; W. R. West, banjo of California manufacture.

CLASS 34.—J. Detrick & Co., best tents; W. H. Burton, best awnings; Mrs. W. H. Burton, awnings for bird cages.

CLASS 23.—E. Hook & Co., kitchen table; H. Huickelthier, portable reading desk; California Spring Bed and Mattress Company, Crandall spring bed (awarded Sept. 19th).

CLASS 9.—Hall & Kelshaw, metallic boat; San Francisco Yacht Club, display of yacht and ship models.

CLASS 12.—S. F. Forge Co., forged and finished axles.

CLASS 22.—B. Graves, Oppenheim buggy, California invention.

CLASS 18.—Yates & Co., display of coal oil lamps; C. J. Becht, display of soda water fountain (Puffers).

CLASS 25.—D. Woerner, wine casks; E. A. Stockton, step ladders.

CLASS 33.—Hartshorn & McPhun, opaque window shades and fixtures; John Taylor, assayer's materials.

CLASS 30.—Heuter Bros., sheet wax, California manufacture; Whittier, Fuller & Co., white lead, California manufacture; California Bleaching Soap Company, California bleaching soap.

CLASS 45.—Miller, Seivers & Co., display of hardy evergreens and plants, \$25; cacti, \$5; begonias, \$5; roses in bloom, \$5; fuchsias, \$5; variegated geraniums, \$5; cut dahlias, \$10; single piece of floral work, \$10; basket of cut flowers, \$5; wreath of cut flowers, \$5; pair bouquets (15 inches high, not less), \$5; pair hand bouquets, \$5; bouquet for a bride, \$5; second most attractive and continuous display during the exhibition, medal and \$75; R. B. Woodward, display of ferns and cycloids, \$10; tropical plants, \$25; single palm tree, \$10; most attractive and continuous display during the exhibition, medal and \$100.

CLASS 1.—Thompson & Upson, H. W. John's asbestos cement for covering pipe; I. L. Merrill, steam packing; W. C. Campbell, boiler composition — "Hasadyder;" Thompson & Upson, H. W. John's double vacuum asbestos and felting covering.

CLASS 19.—Carmen Island Salt Co., display of salt.

CLASS 46.—Harris & Bradley, patent fruit dryer.

CLASS 40.—Mrs. J. C. Harper, display of crochet work.

CLASS 26.—C. Bruckhardt, display of Limburger cheese.

CLASS 43.—W. Battles, mechanical drawing by an apprentice.

The following are the awards for best display of fine arts:

Painting in oil by a local artist, "The California Alps," painted by William Keith, \$250; allegorical painting in oil, "Gil Blas," by Firman Bouvy, medal; still life in oil, "Fruit," by Charles Prosch, medal; animal painting in oil, "Boy and Dog," by Thomas Hill, medal; historical painting, oil, "Street Scene in Old Paris," by Jules Tavernier, medal; portrait painting, oil, Pebbles & Baldwin, medal; marine painting, oil, "A Storm," by James Hamilton, medal; flower piece, oil, "White and Red Cacti," by Thomas Hill, medal; painting in water colors, "Flowers and Butterflies," by Arthur Nahl, medal; painting on exhibition by other than local artists, "The Passing Show," by J. G. Brown, New York, medal; general display of water colors, G. G. Garibaldi, medal. For the largest and best display of paintings by any exhibitor, a prize of \$250 was awarded to D. Gale of Philadelphia.

The authorities think Miles' victory, dearly bought, though they commend the troops for bravery. Within the last year the Seventh Cavalry has lost 18 officers in action, and friends of officers in that regiment are petitioning for their transfer.

Nothing gives so life-like a look to photographs as real skillful retouching and coloring. When this is well done by a good artist, it makes a picture superior to oil in our estimation, and Morse's Palace of Art, No. 417 Montgomery street, is the place to find them.

PASSENGERS by the overland railroad are increasing in numbers.

General News Items.

THE gross receipts of the St. Louis exposition and fair foot up \$116,300.

THE Susquehanna Coal Company's men at Nauticoke have resumed work at 10% advance. JOHN FARGENHANS, of Boston, has been awarded the contract for roofing the Appraisers' Store in this city.

ATTORNEY-GENERAL DEVENS will ask Congress to appropriate \$225,000 to cover the deficiency for the Department for the past fiscal year.

INVESTIGATION shows that the Patent Office fire was not caused by incendiaryism or spontaneous combustion, but resulted from carelessness.

GOLD CARDIFF, the pedestrian who began to walk 1,500 miles in 1,000 hours, on Sunday, August 26th, in London, successfully finished his task on Saturday.

THE Nez Perces war is probably ended. Joseph's band has surrendered to Gen. Miles, after being kept for three days under fire in the ravines.

It is the intention of Sir Alfred Young to have the steamer *Pandora* refitted for another start for the Arctic regions next spring. He will probably try the Spitzbergen route.

The teller in the Branch Bank of Montreal, at Toronto, has absconded with \$10,000. He was well known in social circles and believed to have been a heavy speculator. The loss to the bank, it is presumed, will be heavy.

QUARTERMASTER GENERAL MEIGGS, in a communication just published, states that portions of the roof of the Capitol, and a large portion of that of the General Postoffice in Washington are liable to conflagration.

THE troubles on the Mexican border are increasing, and war is threatened. An armed body of 400 Mexicans have possession of El Paso in Texas, and threaten to massacre all Americans. The Mexicans claim that El Paso county belongs to Mexico.

At a meeting of merchants who suffered losses by the late riots at Pittsburg, a committee of three was appointed, with power to employ counsel, to represent all parties having losses, the expenses incurred to be divided among claimants in proportion to the amounts involved.

NOTICE.

I wish to call the attention of Newspaper proprietors and the Printing trade generally to something new, Column Advertisements Stereotyped on Metal Bodies. All standing matter should be stereotyped in this manner. The printer saves time and money by adopting this process; they are light and durable, and are cast with hard type metal, so that they will stand the pressure with the type; they are finely finished; and ready for the press in two hours after ordered. All forms sent home clean and free from dirt, grease and clay. The trade will find the using of these stereotyped column advertisements a labor-saving invention. Strict attention paid to all orders and prompt delivery of well finished work. I also manufacture shaved and unshaved leads; good metal and true. Shaved slugs of every description, cut to any length, and no extra charge. Liberal inducements to parties furnishing their own metal. Also, brass and metal foot slugs; figured slugs of every description; composing and make-up rules, etc.

Everything supplied by me is of superior quality and workmanship at the lowest rates for cash.

JAMES S. McLAREN, STEREOTYPY,

622 Clay Street, San Francisco.

LEATHER.

[WHOLESALE.]

WEDNESDAY M., October 10, 1877.

Sole Leather, heavy, lb.	26 @ 23
Light, lb.	22 @ 24
Jodot, 8 Kil, doz.	43 @ 60
11 to 13 Kil.	40 @ 60
14 to 19 Kil.	30 @ 60
Second Choice, 11 to 16 Kil.	55 @ 70
Cornellian, 12 to 16 Kil.	57 @ 67
Females, 12 to 13 Kil.	57 @ 67
14 to 16 Kil.	57 @ 67
Simon Ulmo, Females, 12 to 13 Kil.	58 @ 62
14 to 15 Kil.	58 @ 62
16 to 17 Kil.	58 @ 62
Simon, 15 Kil.	58 @ 62
20 Kil.	58 @ 62
24 Kil.	58 @ 62
Robert Calif, 7 and 9 Kil.	58 @ 62
Kips, French, lb.	1 @ 1 25
Cal, doz.	40 @ 60
French Sheep, all colors.	3 @ 15 00
Eastern Calf for Backs, lb.	1 @ 1 25
Sheep Roans for Topping, all colors, doz.	9 @ 13 00
For Linings.	5 @ 10 50
Cal, Russet Sheep Linings.	1 75 @ 4 50
Boot Legs, French Calf, pair.	4 @ 6 75
Good French Calf.	5 @ 5 25
Best Jodot Calif.	5 @ 5 25
Leather, Harness, lb.	35 @ 38
Fair Bridle, doz.	43 @ 72 00
Wet, doz.	30 @ 50 00
Skinning, lb.	18 @ 20
Buff, ft.	17 @ 18
Wet Side.	17 @ 18

Gold, Legal Tenders, Exchange, Etc.

[Corrected Weekly by SUTRO & Co.]

SAN FRANCISCO, October 10, 3 P. M.

LEGAL TENDERS IN S. F., 11 A. M., 97 1/2 SILVER, 4 @ 31

GOLD IN NEW YORK, 103 1/2.

GOLD BARS, 900. SILVER BARS, 9 @ 15 1/2 cent. discount.

EXCHANGE ON NEW YORK, 1 1/2; on London bankers, 49 1/2;

Commercial, 49 1/2; Paris, five francs 95 dollar; Mexican dollars, 93 1/2.

LONDON Consols, 95 3/16; Bonds, 106 1/2.

QUICKSILVER IN S. F., by the flask, 3 lb, 48 @ 50c.

METALS.

[WHOLESALE.]

THURSDAY, M., October 11, 1877.

IRON.—		
American Pig, ton.	28 00	@ 32 00
Scotch Pig, ton.	32 00	@ 33 00
White Pig, ton.	28 00	@ 33 00
Refined Bar, ton.	31 00	@ 32 00
Oregon Pig, ton.	31 00	@ 32 00
Refined Bar, ton.	31 00	@ 32 00
Horse Shoes, keg.	5 00	@ 6 00
Nail Rod.	—	@ 7 1/2
Norway, Oval.	—	@ 7 1/2
Roller.	—	@ 7 1/2
COPPER.—		
Copper Tinned.	37 00	@ 40
Sheeting, lb.	37 00	@ 40
Sheeting, Yellow.	21 00	@ 22 1/2
Sheeting, Old Yellow.	16 00	@ 17 1/2
Composition Nails.	21 00	@ 22 1/2
Composition Bolts.	24 00	@ 25 1/2
STEEL.—		
Cast, lb.	14 00	@ 15
Anderson & Woods, ordinary sizes.	16 00	@ 17
Drill.	16 00	@ 17
Flat Bar.	15 00	@ 16
Flow Steel.	8 1/2	@ 12 1/2
10x14 I C Charcoal.	8 50	@ 9 00
Banca Tin.	24 00	@ 25
Australian.	19 00	@ 20
ZINC.—		
By the Cask.	11 00	@ 12
Zinc Sheet 7 1/2 ft, 7 to 10, lb.	11 00	@ 12
7 1/2 ft, 11 to 14.	11 00	@ 12
8 1/2 ft, 8 to 10.	12 00	@ 13
8 1/2 ft, 11 to 10.	12 00	@ 13
NAILS.—		
Assorted sizes.	3 00	@ 3 25
QUICKSILVER.—		
By the lb.	47 1/2	@ 50

GENERAL MERCHANDISE.

[WHOLESALE.]

WEDNESDAY M., October 10, 1877.

BAGS.—		
Jobbing.		
Hand Sewed, 2x36, 10 @	—	@ 10
21x36.	—	@ 10
Machine Sewed, 2x36, 10 @	—	@ 10
Flour sacks, half, 35 @ 61	—	@ 61
Quarters.	5 @ 61	@ 61
Eighths.	4 @ 61	@ 61
Hessan, 60 inch.	14 @ 61	@ 61
45 inch.	9 @ 61	@ 61
40 inch.	8 @ 61	@ 61
Wool Sacks.	—	@ 9
Hand Sewed, 3 1/2 lb, 42 1/2 @	—	@ 42 1/2
Machine Sewed.	—	@ 42 1/2
4 lb.	—	@ 42 1/2
Standard Gunnies.	15 @ 16	@ 16
Bean Bags.	6 @ 8	@ 8
CANDLES.		
Crystal Wax, lb.	17 @ 17 1/2	@ 17 1/2
Eagle.	12 @ 12 1/2	@ 12 1/2
Patent Sperm.	25 @ 30	@ 30
CANED GOODS.		
Assorted Pie Fruits.	—	@ 23 00
2 lb cans.	—	@ 23 00
Nickle do.	—	@ 23 00
Jams and Jellies.	1 25 @	@ 25
Pickles, 1/2 gal.	3 50 @	@ 3 50
Sardines, or box.	1 65 @ 1 90	@ 1 65
Ht Boxes.	3 00 @	@ 3 00
Preserved Beef.	—	@ 4 00
2 lb, doz.	4 00 @	@ 4 00
do Beef, 1 lb doz.	6 50 @	@ 6 50
Preserved Mutton.	—	@ 6 00
2 lb, doz.	6 00 @	@ 6 00
Beef Tongue.	6 50 @	@ 6 50
Preserved Ham.	—	@ 6 50
2 lb, doz.	6 50 @	@ 6 50
Deviled Ham.	—	@ 5 50
do.	—	@ 5 50
do Ham, 1 lb doz.	3 00 @	@ 3 00
COAL.—		
Australian, ton.	9 50 @	@ 9 50
Coast Bay.	7 00 @	@ 7 00
Bellingham Bay.	7 00 @	@ 7 00
Seattle.	7 00 @	@ 7 00
Sumnerland.	14 00 @	@ 14 00
Mt Diablo.	4 75 @ 5 75	@ 4 75
Lehigh.	22 00 @	@ 22 00
Liverpool.	8 50 @ 9 00	@ 8 50
West Hartley.	9 00 @ 9 50	@ 9 00
Scotch.	25 @ 9 50	@ 25
Seranton.	13 00 @ 16 00	@ 13 00
Vancouver Id.	9 00 @	@ 9 00
Charcoal, sack.	75 @	@ 75
Coke, blk.	60 @	@ 60
Sandwich Id, lb.	21 @	@ 21
Costa Rica.	18 @ 20	@ 18
Guatemala.	18 @ 20	@ 18
Java.	25 @	@ 25
Manila.	19 @	@ 19
Ground, lb.	25 @	@ 25
FISH.		
Sac to Dry Cod.	5 @ 6	@ 5
do in cases.	5 @ 6	@ 5
Eastern Cod.	9 @ 10	@ 9
Salmon, blk.	9 00 @ 10 00	@ 9 00
Ht Blbs.	4 75 @ 5 25	@ 4 75
2 lb cans.	3 10 @ 3 20	@ 3 10
Pkld Cod, blk.	22 00 @	@ 22 00
Ht Blbs.	11 00 @	@ 11 00
Mackerel, No. 1.	—	@ 14 00
Ht Blbs.	14 00 @ 15 00	@ 14 00
In Kits.	3 00 @ 3 25	@ 3 00
Ex Mess.	3 25 @ 4 00	@ 3 25
Pkld Herring.	3 00 @ 3 50	@ 3 00
Boston Sunk Hg.	40 @ 50	@ 40
LIME, Etc.		
Lime, Sta Cruz.	2 00 @ 2 25	@ 2 00
Cement, Rose.	2 75 @ 3 50	@ 2 75
Portland.	4 75 @ 5 50	@ 4 75
PLASTER.		
Plaster, Golden.	3 00 @ 3 25	@ 3 00
Lead Plaster.	10 @ 12 50	@ 10
NAILS.		
Assorted sizes, keg 3 25 @ 4 00	—	@ 3 25
Pacific Blue Co.	—	@ 1 00
Neafuse, No. 1.	1 00 @ 90	@ 1 00
Oyster, No. 1.	1 00 @	@ 1 00
do, No. 2.	1 00 @	@ 1 00
Baker's A. A.	1 25 @ 1 30	@ 1 25
Oliver, Plagiol.	5 @ 75	@ 5
Possel.	4 75 @ 5 25	@ 4 75
Palm, lb.	9 @	@ 9
Linseed, Raw, hbl.	75 @	@ 75
Bolled.	80 @	@ 80
Cocanut.	60 @ 50	@ 60
China nut, cs.	68 @ 70	@ 68
Sperm.	1 60 @ 65	@ 1 60
Coast Whales.	60 @ 65	@ 60
Polar, refined.	10 @ 15	@ 10
Ollephine.	27 @	@ 27
Devoe's Bril.	25 @ 27	@ 25
Nonpareil.	20 @ 25	@ 20
Eureka.	23 @ 25	@ 23
Barrel kerosene.	22 @ 25	@ 22
Downer Ker.	45 @ 50	@ 45
Elaine.	45 @	@ 45
PAINTS.		
Pure White Lead.	92 @ 104	@ 92
Whiting.	11 @	@ 11
Putty.	4 @ 5	@ 4
Chalk.	2 @	@ 2
Paris White.	2 @	@ 2
Ochre.	3 @	@ 3
Venetian Red.	3 @	@ 3
Averill Mixed.	—	@ 40
White & tints.	2 00 @ 40	@ 2 00
Green, Blue & Yellow.	3 00 @ 30	@ 3 00
Ch Yellow.	3 00 @ 30	@ 3 00
Chalk.	10 @ 15	@ 10
Metallic Roof.	30 @ 1 60	@ 30
RICE.		
China No. 1, lb.	6 @ 6 1/2	@ 6
Hawaiian.	5 @ 5 1/2	@ 5
SALT.		
Cal. Bay, ton.	15 00 @ 25 00	@ 15 00
Common.	10 00 @ 12 00	@ 10 00
Carmel Id.	15 00 @ 25 00	@ 15 00
Liverpool fine.	22 50 @	@ 22 50
SOAP.		
Castle, lb.	10 @ 10 1/2	@ 10
Common brands.	4 1/2 @ 6	@ 4 1/2
Fancy brands.	7 @ 8	@ 7
SPICES.		
Cloves, lb.	45 @ 50	@ 45
Cassia.	22 1/2 @ 25	@ 22 1/2
Nutmegs.	85 @ 90	@ 85
Pepper Grain.	15 @ 17	@ 15
Mustard.	15 @ 16	@ 15
Mustard, Cal.	15 @ 16	@ 15
1 lb glass.	1 50 @	@ 1 50
SUGAR, ETC.		
Cal. Cuhe, lb.	13 @	@ 13
Powdered.	13 @	@ 13
Pine crushed.	13 @	@ 13
Granulated.	12 @	@ 12
Golden C.	10 @ 10 1/2	@ 10
Hawaiian.	10 @ 11	@ 10
Cal. Syrup.	7 @	@ 7
Hawaiian Molasses.	25 @ 30	@ 25
TEA.		
Young Hyson.	—	@ 35
Moynay.	—	@ 35
Country pkd Gunpowder & Imperial.	50 @ 60	@ 50
Hyson.	30 @ 35	@ 30
Food Chow O.	35 @ 60	@ 35
Japan, 1st quality.	40 @ 50	@ 40
2d quality.	25 @ 35	@ 25

Signal Service Meteorological Report.



## Iron and Machine Works.

**PACIFIC ROLLING MILL CO.,**  
SAN FRANCISCO, CAL.

Established for the Manufacture of  
RAILROAD AND OTHER IRON

Every Variety of Shafting,  
Embracing ALL SIZES of  
Steamboat Shafts, Cranks, Piston and Con-  
necting Rods, Car and Locomotive  
Axles and Frames,

—ALSO—  
Hammered Iron of Every Description and Size  
Orders addressed to PACIFIC ROLLING MILL  
COMPANY, P. O. Box 2032, San Francisco, Cal., will re-  
ceive prompt attention. OFFICE: 16 First Street.  
The highest price paid for Scrap Iron.

THOS. PENDERGAST.

HENRY S. SMITH

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MANUFACTURERS OF

## IRON CASTINGS

## and MACHINERY

OF ALL KINDS.

mont Street, Bet. Howard and Folsom

SAN FRANCISCO.

## SHEET IRON PIPE.

## Risdon Iron and Locomotive Works

Corner Howard and Beale Streets,

Are prepared to make SHEET IRON AND ASPHALTUM  
PIPE, of any size and for any pressure, and contract to  
lay the same where wanted, guaranteeing a perfect work-  
ing pipe with the least amount of material.

Standard sizes of Railroad Car Wheels, with special pat-  
terns for Mining Cars. These small wheels are made of  
the best Car Wheel Iron, properly chilled, and can be  
fitted up with the improved axle and box—introduced by  
this company, and guaranteed to outlast any other wheels  
made in this State.

All kinds of Machinery made and repaired.

JOSEPH MOORE, Superintendent.

## PHELPS MANUFACTURING COMPANY.

Manufacturers of all kinds of

Wharf and Bridge Bolts, Railroad Trestle  
Work, Car Frames and Bolts, Machine  
Bolts, Set Screws and Tap Bolts,  
Log or Coach Screws.

ALL STYLES OF FANCY HEAD BOLTS.  
HOT AND COLD PRESSED HEXAGONAL AND  
SQUARE NUTS, WASHERS, BOLT ENDS,  
TURNBUCKLES, ETC., ETC.

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37 Fremont St., cor. Mission, S. F.

## HALL & KELSHAW,

PRACTICAL BOILER MAKERS,

Marine, Stationary and Portable Boilers, Smoke Stacks,  
Hydraulic Pipe, Oil or Water Tanks, Ore and  
Water Buckets, Gasometers, Girders, Bridges  
and Iron Ship Building.

ALL KINDS OF SHEET IRON WORK.  
Repairing promptly attended to at the  
lowest possible terms.

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Manufacture Iron Castings and Machinery  
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STEVENSON'S PATENT

Mold-Board AMALGAMATORS,

Golden State Pressure Blowers.

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## CALIFORNIA BRASS FOUNDRY,

No. 125 First Street, Opposite Minna,  
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All kinds of Brass, Composition, Zinc, and Babbitt  
Metal Castings, Brass Ship Work of all kinds, Spikes,  
Sheathing Nails, Rudder Braces, Hinges, Ship and Steam-  
boat Bells and Gongs of superior tone. All kinds of Cocks  
and Valves, Hydraulic Pipes and Nozzles, and Hose Con-  
necting and Connections of all sizes and patterns, furnished  
with dispatch. PRICES MODERATE.  
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California Machine Works,  
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Builders of QUARTZ, SAW AND FLOUR MILLS.

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INCLUDING BATTERIES, AMALGAMATING PANS AND SETTLERS, CONCENTRATORS, ORE FEEDERS,  
CRUSHING ROLLS AND ROCK BREAKERS, ALSO, WATER JACKET SMELTING FURNACES,  
FOR REDUCING LEAD, SILVER AND COPPER ORES, QUICKSILVER FURNACES,  
RETORTS AND CONDENSERS, ROASTING AND CHLORIDIZING FURNACES,  
SUGAR MILL MACHINERY, WATER WHEELS, ETC., ALL OF THE  
LATEST AND MOST IMPROVED CONSTRUCTION.

Agents for the Allen Engine Governor, Cook's Boiler Feeder and Heater, Buckminster  
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GEO. W. FOGG, Supt.

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Kinds of Machinery for Mining Purposes.

Flouring Mills, Saw Mills and Quartz Mills Machinery  
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Light and Heavy Castings of Every De-  
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Sole Proprietors and Manufacturers of  
Lynch's Ventilating and Illuminating Tile,  
The Only Illuminating Tile Manufactured for Light-  
ing Cellars, Basements and Dark Rooms which pro-  
vides proper ventilation for such places

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## STEAM ENGINES AND BOILERS

Of all sizes—from 2 to 60-Horse power. Also, Quartz  
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Importers of and Dealers in

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CHEMICAL APPARATUS AND CHEMICALS, DRUG-  
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We would call the special attention of Assayers, Chem-  
ists, Mining Companies, Milling Companies, Prospectors,  
etc., to our stock of Clay Crucibles, Muffles, Dry Cups,  
etc., manufactured by the Patent Plumbago Crucible  
Co., of London, England, for which we have  
been made Sole Agents for the Pacific Coast. Circulars  
with prices will be sent upon application.  
Also, to our large and well adapted stock of

## Assayers' Materials & Chemical Apparatus,

Having been engaged in furnishing these supplies since  
the first discovery of mines on the Pacific Coast.

Our Gold and Silver Tables, showing the value per  
ounce Troy at different degrees of fineness, and valuable  
tables for computation of assays in grains and grammes,  
will be sent free upon application.

JOHN TAYLOR & CO.

## THOS. PRICE'S

## Assay Office and Chemical Laboratory,

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Deposits of bullion received, melted into bars, and re-  
turns made in from 24 to 48 hours.

Bullion can be forwarded to this Office from any part of  
the interior by Express, and returns made in the same  
manner.

Careful Analysis made of Ores, Metals, Soils, Waters,  
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upon. Consultations on Chemical and Metallurgical  
questions.

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Near First and Market Streets.

Ores worked by any process.

Ores sampled.

ASSAYING in all its branches.

Analysis of Ores, Minerals, Waters, etc.

WORKING TESTS MADE.

Plans furnished for the most suitable process  
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Special attention paid to Examinations of  
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Mining Engineers and Metallurgists

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Assayer and Metallurgical Chemist,

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## INSTRUCTIONS IN ASSAYING,

Chemical Analysis, Determination of Minerals, and us-  
e of the Blow-pipe.

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Montgomery Street, up-stairs. TERMS MODERATE.

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Clothing.

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Patented May 12, 1873.  
USE NO OTHER, AND INQUIRE FOR THESE  
GOODS ONLY.

## ARTIFICIAL LIMBS.

MENZO SPRING,

MANUFACTURER OF

ARTIFICIAL LIMBS.

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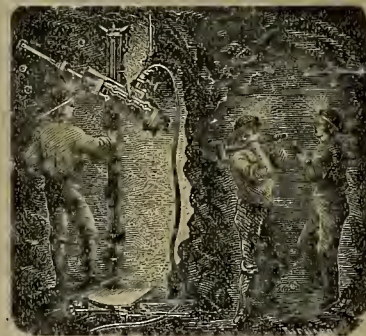
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Descriptive circulars, blanks for  
measurements, with instructions and  
price list free on application.

50 LARGE MIXED CARDS, with name, 13c. 40 in  
case 13c. 25 styles Acquaintance Cards 10c. Agents  
outfit 10c. DOWD & CO., Bristol, Conn.

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## The Ingersoll Rock Drill



Is Extensively Used in the East and

## TAKES THE PLACE OF ALL OTHERS,

Wherever introduced, because it can be run with less  
power, labor and repairs, and do more work than any  
other Drill in the market. It has but few parts, is easily  
handled, being light, and has AUTOMATIC FEED, which  
saves labor. WE ASK FOR TRIAL AGAINST ANY  
COMPETITOR. For particular information regarding  
Drills or Air Compressors, send for circular to

J. B. REYNOLDS,

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## THE O'HARRA CHLORIDIZING FURNACE

Guaranteed to Chloridize from 85 to 95 per cent. of any  
gold or silver ores that are not more profitable for smelt-  
ing. Will also desulphurize ores and put them in proper  
shape for working in cupola furnaces.

Cost of Roasting and Chloridizing 20 Tons  
in 24 Hours by this Process:

One man.....	\$ 4 00
One man.....	3 00
Wood—23 Cords at \$3 per cord.....	5 25
Salt—1,600 lbs at 2 1/2 cents.....	40 00

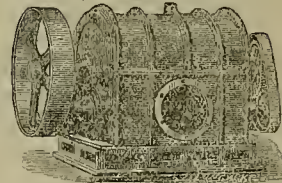
Cost of 20 tons.....\$52 25  
Cost of one ton.....2 61 1/2

In a furnace of three or four times this capacity the  
cost is decreased by 20 per cent.

The furnace is now working successfully at the Poe Con-  
solidated Co.'s mines, in Peavine District, Nev., and at  
the Eschquer mill, Alpine Co., Cal. For further in-  
formation, apply to

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## BAKER'S ROTARY PRESSURE BLOWER (FORCED BLAST.)



WARRANTED SUPERIOR TO ANY OTHER  
J. C. Sanderling, Sole Ag't Pacific Coast,  
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## THE LANE & BODLEY COMPANY,

John and Water Sts., Cincinnati, O.,

Sole Manufacturers of.

## BRUCKNER'S PATENT REVOLVING FURNACE,

For Chloridizing, Desulphurizing and  
Roasting Ores.

—ALSO—

STEAM ENGINES, SAWMILLS, SHAFTING, GEAR-  
ING AND MINING MACHINERY.

Send for our Illustrated catalogue.

## HUNT, DOUGLAS & STEWART Process,

Used in Connection With PURVINE

## Wooden Amalgamating Fans and Settler.

This is a complete, perfect and economical adaptation  
of the humid method to the treatment of Gold or Silver  
ores, associated with

## COPPER

And other base metals, or to ores free from base metals.  
It can be adapted to any first-class Gold or Silver mill, at  
a reasonable additional expense.

For further information, address

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## To Ship and Engine Builders, Steam ship Companies, Etc.

A Mechanical Engineer, having an extensive experience  
in Marine Engineering (especially compound) and Iron  
Ship Building, also in Steam Engines and Machinery in  
general, is open for engagement. First-class references.

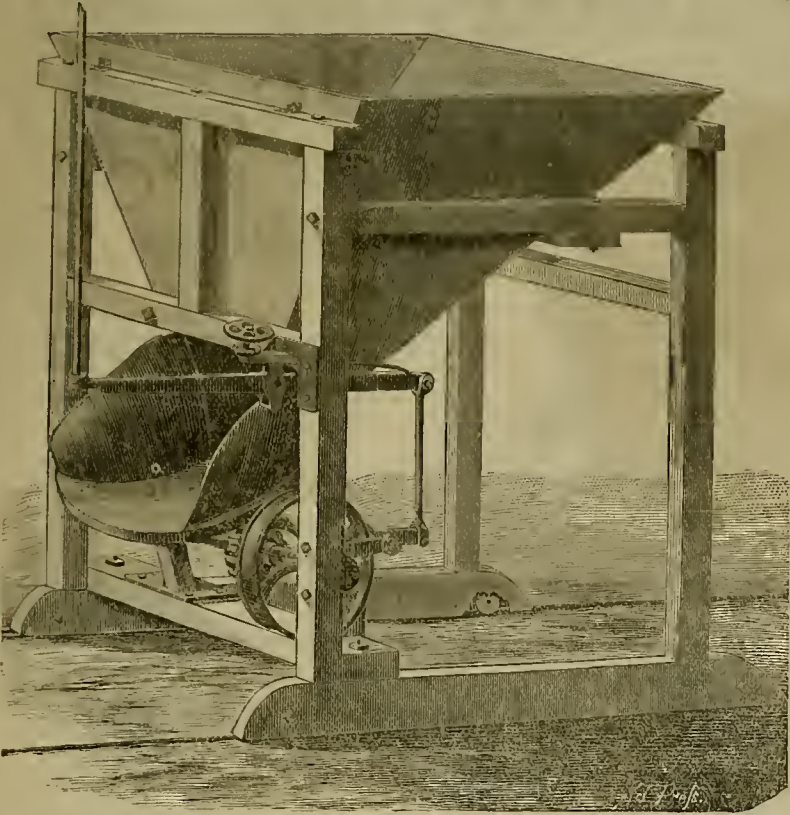
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entific Press.



# \$1,000 Challenge Ore Feeder,

AWARDED FIRST PREMIUM

At the Tenth Industrial Fair of the Mechanics' Institute



It may be considered as now fully demonstrated, by careful and long-continued experimentation, that the plan upon which a perfect ore feeder must be constructed is that of the carrier, and not that of the shaking table. Uniform and accurate feeding is not possible upon the latter plan. The ore must be evenly carried upon a steadily advancing plane or table, to the line of discharge, and there simply dropped. Spasmodic or jerky contrivances will not answer the purpose.

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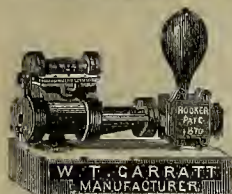
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WASHINGTON, D. C., September 26th, 1877. }

Inventors and their Attorneys are informed that, so  
far as can be learned, none of the files of pending ap-  
plications were lost in the recent fire, nor a single origi-  
nal document of any kind.

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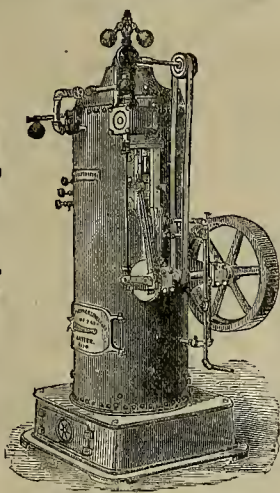
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# MINING AND SCIENTIFIC PRESS.

An Illustrated Journal of Mining, Popular Science and General News.

BY DEWEY & CO.,  
Patent Solicitors.

SAN FRANCISCO, SATURDAY, OCTOBER 20, 1877.

VOLUME XXXV.  
Number 18.

## The Newton Hydraulic Dredging Machine.

The engraving on this page represents the Newton hydraulic dredge and mining machine, which has been operating successfully in the East for the past two years, but has just been introduced on this coast. The first machine of the kind built here is now in process of construction at the Pacific iron works in this city. The engraving was made from a photograph of the dredge now in operation on Galveston island, harbor of Galveston, Texas. In this, A is the suction pipe lowered to one of its many working positions; B, B, vacuum chambers; C, vacuum column or dome to equalize pressure; D, discharge pipe; E, steam and water pipes; F, swivel or turn table on which discharge pipe revolves.

We have been shown letters from the owners of the Galveston dredge, in which they give the capacity at 5,000 cubic yards in 10 hours, and state that it works continuously in a satisfactory manner. The patentee guarantees that the dredge will perform this amount of work regularly.

The principles employed in the Newton hydraulic dredge are a combination of the well known forces of hydrostatic pressure, the formation of a vacuum by steam pressure and sudden condensation by means of cold water injected in the vacuum cylinders, and the disintegrating force of water jets discharged against the mineral to be dredged, at a velocity of 250 feet per second. The operation of the dredge may be briefly described as follows: The suction pipe, to which three disintegrating or "digging" pipes are attached, is lowered through a well in the boat containing the machinery, until its lower end rests upon or is near to the material to be elevated; a vacuum is then formed by driving the air from the vacuum cylinders by steam from the boilers, and at the moment when the air is thus expelled the steam is condensed by the sudden injection of cold water, and the material comes from under the pipe, whether it is mud, stone, gravel or clay. There being two vacuum cylinders, working alternately, governed by a large dome, the steam from the discharge pipe is continuous. The dredge is capable of working in any kind of material, and anything which will pass through the pipe can be raised. In fact, in several instances, the Galveston dredge brought up large pieces of anchor chain from the bottom of the bay, showing that pieces of rock and debris not larger than the pipe can easily be removed by the device. The suction pipe is telescopic, and the number of joints is regulated by the depth at which the machine is to work.

This machine will be extremely valuable in the tule lands of this State where so much dredging and levee building is done. The levees can be built by the dirt drawn up from the bottom of the sloughs or rivers and deposited by the machine in the proper place, 600

or 1,000 feet distant without rehandling. By this method the work can be done very rapidly and cheaply, and the levees can be built higher, wider and stronger than they usually are. The work of building levees in this State, along the tule lands, is one of large proportions, and hundreds of thousands of dollars are annually spent. This machine can accomplish the work more expeditiously than at present and with much less expense.

It is intended also to apply the Newton dredge to the purposes of river mining, a new method of mining now coming into vogue. In this class of mining the auriferous material is pumped up from the bottoms of the rivers which carry water enough to float the dredges. This dredge can take the material from below and discharge it high enough so that its golden

## Impurities in Commercial Copper.

The usual impurities occurring in the copper of commerce are iron, arsenic and silver, in small quantities almost invariably; bismuth very frequently, except in that from Russia and Australia; tin, antimony and sulphur occasionally, and lead almost invariably in sheet or bolt copper, but not in cake copper; with nickel, cobalt and gold less frequently. The effect of iron is to render the copper harder and paler in color; sulphur and antimony likewise harden copper, make it grayer in color and impair its malleability and tenacity. Copper containing 10 ounces of antimony per ton is stated by Dr. Miller to be quite unfit for use in the prepara-

## Relief Valves for Fire Hose.

Several years ago, Dr. Charles E. Blake, of this city, brought out here a relief valve for regulating the pressure in the hose of fire engines, to prevent bursting. The apparatus was tested several times with satisfactory results, but other parties were also in the field with similar devices, somewhat different in construction, none of which, however, covered the main idea. That is, although they all had patents, none of the patents covered the idea of a regulating apparatus in combination with a fire hose to prevent its bursting.

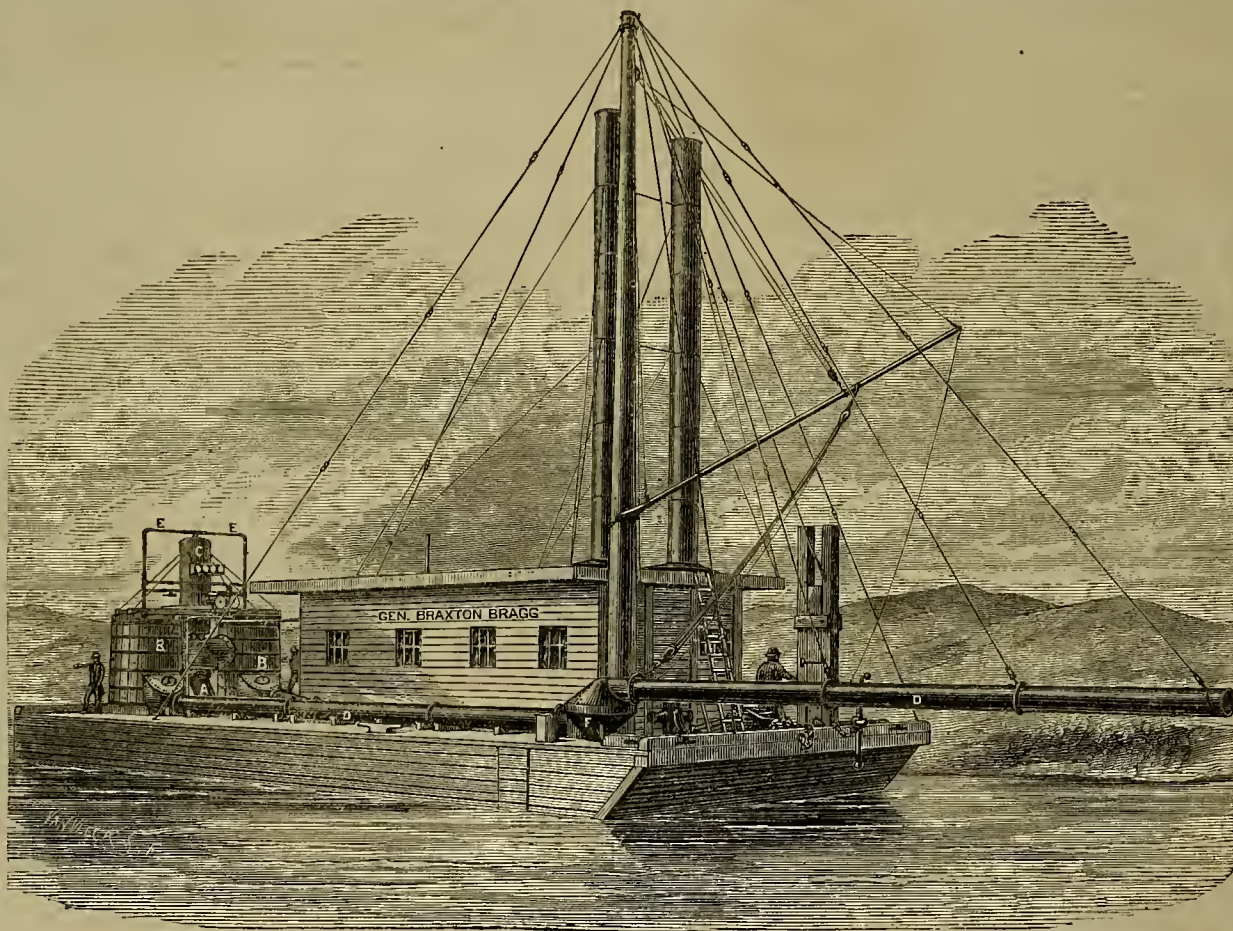
On examination, Dr. Blake found that the first inventor in this line was Thomas H. Bailey, who patented a device of the kind in 1864, but although he was the first inventor of a relief valve for fire hose—or rather water cylinders—he had not claimed it broadly as such. Dr. Blake then purchased the patent from the administrators of Bailey's estate, and has reissued it through the MINING AND SCIENTIFIC PRESS Patent Agency, so as to cover broadly the combination of an automatic relief valve with the hose of a fire engine.

Previous to this invention the only valve employed for relieving the pressure upon fire hose, to prevent it from bursting, in case the water passage through the hose should become obstructed, or in case of excessive pressure from the engine, was one operated by hand. This valve, however, was ineffectual, unless the engineer or other person whose duty it was to open and close the valve had previous notice that the pressure was increasing or had increased, and as these emergencies are always likely to occur instantaneously, without previous notice, the hose would

often burst before the relief valve was operated and, even then, the excitement which always prevails at a fire rendered a strict attention to this valve almost impossible.

Bailey's invention, the patent for which, as stated, has been reissued by Dr. Blake, remedied all these difficulties by applying a valve at some point between the engine or pump and hose nozzle that is automatic in its action—that is, it is opened by any excess of pressure in the hose or pump-cylinder, so as to discharge an additional stream and thereby relieve the inside pressure accordingly. The valve is kept on its seat by a spring, and it will therefore resist a pressure corresponding to the power of the spring, so that ordinarily it remains closed; but in case the pressure in the hose should be increased by any means, so as to overcome the tension of the spring and threaten to burst the hose, the spring will allow the valve to open.

In nearly every city in the United States, appliances of this character are in use, and Dr. Blake proposes to commence action against all of them to compel them to work under his patent at a suitable compensation.



THE NEWTON HYDRAULIC DREDGE AND MINING MACHINE.

contents may be sluiced off and saved.

One of these dredges has been, for some time at work at Chicago, where it has performed its labors successfully and in a satisfactory manner. During the Centennial exhibition a board of French engineers visited Chicago to witness the operation of the Newton dredge, and the board thought so well of it that the result was an order for one by the French government for trial. Capt. Eads, of Mississippi jetty fame, also thinks very highly of the device. One is also being completed for a large quantity of work at Surgeon bay, Wisconsin, as we see by the Chicago *Inter-Ocean* of Sept. 15th. The machine being built here will be put at work as soon as completed.

DURING the present week about \$40,000 worth of sugar mill machinery, manufactured by the Pacific iron works, the Fulton foundry and iron works, and McAfee, Spiers & Co., will be shipped to the Hawaiian islands.

THERE are between 300 and 400 men in Cornucopia district, Nevada.

tion of brass intended for rolling. Arsenic in small quantities hardens the metal, but does not impair its malleability to the same extent as antimony; while the presence of bismuth deteriorates the toughness of the metal. Small quantities of lead are occasionally added to copper intended for rolling, but the addition of only small quantities (one to two per cent.) of this metal renders copper unfit for the manufacture of brass plate and wire. The native metal occurring at Lake Superior is usually very free from impurities, but occasional specimens indicate a minute percentage of silver.

THE Carson *News* says that those returning from Bodie claim that but little work will be done in that section before next spring. The snow is always deep there in the winter time, and the wood being scarce, but few except those in business or employed in the mines will think of stopping.

PROFESSOR GEORGE HADLEY, the famous chemist died at Buffalo, N. Y., on the 10th inst.



## CORRESPONDENCE.

It is the desire of the editors of this journal to be liberal toward all correspondents, and therefore statements and opinions are frequently published, on the authority of the writers, for which we do not assume responsibility.

### Life Among the Lumbermen.

**EDITORS PRESS:**—The place from which this mountain letter is written is not down upon any of the maps of the State that it has been my luck to fall in with, and exactly where it is located it would be difficult for the average traveler to describe after a journey over these crooked hilly roads, the latter part of the distance being accomplished in the night. A trip into Lake county is liable to confuse one's geographical and astronomical knowledge, and notwithstanding all known rules to the contrary, a person need not be surprised after his arrival in this section to find the sun rising in the west and voyaging all day to the eastward, while at night the Big-Dipper and North Star maintain a stubborn position in the southern latitude.

The resident of San Francisco, who, during some future summer, may wish to enjoy the beautiful scenery and exhilarating air of these upper regions of Lake county, can easily secure, in one day's travel, a pleasing variety of river, rail and stage in the accomplishment of his purpose. The Vallejo steamer, which leaves the wharf at the foot of Market street at seven o'clock, will afford a pleasant morning ride on a beautiful sheet of water, of which California may justly be proud, and in a few hours the traveler will find himself transferred to the cars of the California railroad, progressing at moderate speed, with frequent halts, up the thrifty Napa valley, on his way to Calistoga. About noon, and before the prosperous ranches, neatly trimmed vineyards and distant mountain slopes begin to be monotonous, Calistoga, the present northern terminus of the railroad, is announced, and an opportunity afforded to refresh the inner man, preparatory to an afternoon stage ride. By consulting a table of distances, it is evident that in all directions there are mineral springs, mountains and quicksilver mines. I took passage on the Lakeport stage, which seemed to run the nearest to my objective point, and some 15 of us—men, women and children—were soon jolting up the steep side of Mt. St. Helena, behind a six-horse team, controlled by the well-known driver, Wash. Gwin. The climbing process was slow and tedious, but whenever opportunity afforded, whether going down a mountain or along a piece of level road, the horses were made to dash away at the top of their speed.

We were favored with many beautiful mountain views, and, under the constant changes of scenery, the afternoon drew rapidly to a close, until we halted for supper at Bassett's, about 30 miles from Calistoga, and bade the coach-load of passengers farewell. A vehicle, which runs daily between Bassett's and Adam's Springs, furnished the means of transportation over a few miles of rough road, and landed your correspondent among a lot of lumbermen, who are "roughing it" in the most approved style, and where the latch-string of hospitality always hangs out. With the aid of a steam mill and other modern improvements, the residents are making rapid inroads upon a heavily-timbered tract of 4,000 acres.

#### The Settlement at Rice's Mill

Is strictly on the pioneer order, and the visitor to this section need not expect to meet many of the luxuries of modern civilization. The pride of the place and the grand central pivot, around which everything else revolves, is Rice's steam saw mill, with two circular saws and a capacity of about 10,000 feet per day. Scattered about in the vicinity are a lot of wooden cabins, some with and some without fire places, and here in banks, constructed out of rough boards and filled with hay, supplied with heavy army blankets for bed covering, one can sleep soundly under the influence of the clear night air of the mountains. A temporary structure, which does duty as a cook-house and dining-hall, ranks next in dignity to the saw mill, and is presided over by an aged Chinaman, who claims to be one of the pioneers of the State, and, in broken English, tells his story of flush times, when everything was "heap-good" and he cooked in the mines for \$5 and \$6 a day. He made one trip to China with his earnings, several years ago, and has another and a final voyage to the flowery land in contemplation. He is as regular in his habits as a clock, and would as soon think of losing his pig-tail as having a meal five minutes out of time. He has a gong of a primitive pattern, by means of which he announces to the community that meals are in readiness. It consists of an old crosscut-saw plate suspended from a nail on the porch, and at six o'clock every morning he heats a tattoo that often awakens a response in the breasts of the neighboring mountains. Under the sharpening influence of this keen atmosphere, one soon comes to relish the plain and substantial meal of the lumbermen better than he would the best bill of fare that a city hotel can place before him.

#### Hauling Logs.

For the rough work of getting the huge logs out of the woods to the saw mill, the most

powerful motive power that can be obtained in the quadruped line is necessary, and if one wishes to take a slow ride, calculated to impress him with the ponderousness of cattle power, all he has to do is to accompany the "wbackers" on an expedition after a load of logs. So far as the rolling stock is concerned for strength and durability the war chariots of the ancient Romans would suffer by comparison. The truck wheels are made of the butt ends, sawed off, of huge logs, nearly five feet in diameter, and are heavily ironed, with axles and other wood an iron work in proper proportion. Mounted on this odd-looking establishment, 10 head of stout cattle propel us into the forest with the velocity of an ordinary canal boat and a force that bears down all opposition in the shape of mountain boulders and decaying stumps. The ease with which an experienced cattle driver will manage five yokes and snake out and load four or five heavy saw logs from apparently inaccessible places is enough to surprise a person not familiar with the mysteries of the ox-goad. The oxen, with practice, get broken so that they understand the business about as well as the driver and appear perfectly familiar with the jargon of ear-splitting cattle terms that the latter is continually launching at them. With the assistance of heavy chains, by the lumberman's peculiar system of engineering, a heavy load is soon hoisted into position, and the long procession of cattle is seen moving slowly along the dusty road, enveloped in a cloud that resembles a lazily-progressing whirlwind.

#### The Lumber Trade

Of this section is principally local in its character, owing to the difficulties in the way of transportation to a better market. The country is rapidly developing, however, and the proprietor of every new mountain ranch speedily becomes a purchaser to a greater or less extent. The development of quicksilver mines throughout this section has made quite an increase in the demand for lumber, and a large number of saw mills are doing a more profitable business in this county than an outsider would think possible. Speaking of quicksilver mines reminds me that a force of workmen are now engaged prospecting on Uncle Sam mountain, about five miles north of here, and are reported to have taken out several tons of excellent ore. The mountain, which stands rugged and barren, like a huge sentinel guarding Clear lakes, has the appearance of an extinct volcano and is obviously useless for anything except mining purposes. It is said to have been purchased for \$10,000 by the company that now owns and intends to thoroughly prospect it.

#### Mineral Springs.

I would, perhaps, be doing injustice to this section of country if I omitted to mention something about the mineral springs, in which the people appear to take a commendable pride. The ones with which I am most familiar are Siegler's, about two miles east of here. There are 32 different kinds of water, including hot and cold soda, iron and citrate of magnesia springs. It is to be regretted that they are not open to the public, as the place, if properly fitted up, would, no doubt, soon command a large patronage. The present owner is, however, a man of wealth, who evidently does not feel the necessity of converting the property into a paying institution. Adam's, Howard's and other springs in this county have been doing a prosperous business this season, and as a resort for invalids as well as the home of a healthy and prosperous people, Lake county bids fair to increase in notoriety.

Rice's Mill, Lake Co., Oct. 2d, 1877.

### The Mines of Eastern Oregon.

One of the notable features of mining operations in eastern Oregon may be found in the confidence and determination manifested by all who have any interest in these mines. They believe that the country has merit; and acting on this belief, they have been doing their utmost in the way of developing their claims; and, in many instances, have met with much success. In many sections of eastern Oregon there are splendid opportunities for the investment of capital in mining enterprises. One of the greatest and most prominent wants is that of good milling facilities; and these, when supplied, will result in a great change for the better, and put much more money in circulation. In no mining country has the prospector a wider field for operations, and there is no place to which public attention has been attracted where these sons of toil have displayed more energy and vigilance in looking after their claims and endeavoring to make them productive. Many of these men have undergone hardships and privations that are unknown beyond their own immediate circle of acquaintances. They look back to their boyhood days when they were surrounded by home comforts and experienced all the happiness measured out to boys that had pleasant homes, and everything glided along smoothly under the paternal roof. They were lured to the Pacific coast in the expectation of making big fortunes at short notice. They have toiled incessantly, and haven't the heart to return home again unless they have made a respectable stake. How many days and nights of solitude have these veteran prospectors put in while toiling in the mountains and endeavoring to "strike it," and wondering when they do whether they or some one else will carry off the rich prize that their incessant toil has incubated. In their lone cabins on the

bill, where they pass their long dreary nights, uncheered by any of those attributes that come within the category of home comforts, these poor fellows exist along from day to day, still hoping and still believing that the sun of fortune will shine upon them. Brave boys. May you all be ultimately rewarded for the many years of dreary and monotonous labor undergone, and the privations sustained in these laudable efforts to develop the country; for, if ever any class of men deserved to find an oasis in the desert of life, it is the careworn, honest and toiling prospector.

#### Rye Valley Mines.

There are many rich placer and quartz claims in and around Rye valley, and the outlook for this section of eastern Oregon is quite favorable. The camp is situated about 35 miles from Baker City, 15 miles from Farewell Bend, on Snake river, and nine miles from the Weatherby station. Some of the mines have been partly developed, and there is a five-stamp mill in operation. Many failures have been made in the attempts to reduce the ore, and it has been found that the roasting process is the only one through which the mineral can be extracted with profit. Some of the ore shipped to San Francisco has yielded as high as \$200 to the ton, and when crushed by the dry process the yield has been found to be very favorable. Arrangements are being made to crush the ore to better advantage by the introduction of suitable milling machinery, and we understand that parties from Portland intend building a quartz mill during the winter. Mr. Charles Green informs us that there is every prospect of there being a lively camp there next spring. The country seems to embody an immense mass of rich quartz veins, in which silver predominates, and with the right kind of crushing facilities near by, there can be no doubt that Rye valley will be more prosperous than ever. Rock has been found in the camp that goes as high as \$10,000 to the ton, but, by the process of wet crushing, the general yield from quartz has been light, and the camp has been kept in a hazy state in consequence. Quartz was first discovered there in 1870, but placer mining operations have been carried on since 1864. Where water has been abundant, some of the claims have yielded as high as \$300 a day, and parties interested in many of these claims have been doing well the past season. The Monumental, Macedonia and Green discoveries are the principal quartz mines. Each has been worked with a limited force during the season, and the prospects continue encouraging, so much so that the belief is entertained by many that Rye valley will, in time, become one of the prosperous camps of the country.

#### Monumental Mine.

There are some 15 men at work on this mine at the present time. The veins which have been encountered during the season are such as to afford great encouragement to the owners of the property, who expect next season to realize handsomely from their operations in that vicinity. These small ledges are all well defined, and vary from six inches to three feet in width. The strata, too, wear a promising appearance. A tunnel has been run, during the summer, for the purpose of tapping the main ledge about 400 feet below the surface. This will be reached in a few weeks, and there is every indication of the existence of an immense ore body, work on which will yield the company handsome returns for all their labors and investments. The mine is situated about 60 miles from Baker City. The stages of Messrs. Grier & Kellogg make trips to Independence twice a week, and the mode of locomotion from the last-named place to the Monumental, a distance of a few miles, is on the "hurricane deck of a cayuse." Independence is the central business point of that region. There are several good ledges in the immediate vicinity which have been worked to advantage this season.

#### Placer Mines.

There are some placer mines and gravel claims near Independence. W. Johnson & Co. have been doing a fine business with their claims this season. Bomer & Lucas have also been doing a fine business. Gardner & Thompson have a large body of water on Trail creek which they use for mining purposes. A considerable quantity of treasure has been shipped from Independence during the past summer.

S. A. Oglesby has a valuable placer claim at Jordan ranch formerly known as the Kelley bar. The claim is worked by hydraulic machinery, and when there is a full flow of water in use the profits are quite large. The water comes from Jordan gulch and Channing creek in the vicinity and has only been used recently at the rate of a couple of hours per day. The claim embodies about a dozen acres of good ten-dollar diggings.

Two miles below Oglesby's, at the mouth of Dixie creek, the Jett Bros. have dug a ditch on the Cariboo bar. They have taken out considerable money and are making preparations to work their claims on a large scale. They have laid 400 feet of iron pipe besides putting in a flume and doing other work.

Messrs. Gear & Hartwell are conveying water from Sisly creek to the bar on Burnt river. They have extensive diggings, and are certain to realize handsomely from them. Farusworth & Sisly are using a new wheel in their operations on Burnt river known as Scoll's central discharge wheel. The water is raised to a height of 40 feet. There is abundance of good placer ground on either side of the Burnt river for a distance of 26 miles. There is great need of a

ditch by which all this ground could be worked, and if an enterprising company would inaugurate such an enterprise there would be abundance of money in it for all concerned. There are many localities in eastern Oregon where placer mining can be profitably carried on, and with the supply of the needed facilities, we may look for a vast change for the better in the business of the coming season.

#### Notes.

A. D. Hoffstetter, Esq., is building a five-stamp mill about two miles from the Swaizes station, near the stage road. The machinery is all on the ground, and the mill will be ready for operations early in October. The mill will commence crushing rock from the White & Huffman ledge, which is about five miles south from the Burnt river at this point. One hundred tons of rock are now lying at the mine ready for crushing. A shaft is down 80 feet on this mine, and a tunnel runs in 170 feet. There is a considerable force employed at this mine, and, as the rock taken out is of good quality, a profitable season's work is assured. Mr. Hoffstetter has been engaged in mining in this vicinity for several years. His mill is constructed on improved principles, and there is no doubt but that the enterprise will pay him well.

Messrs. Estabrooks, Wood and Blanchard are working a five-foot ledge about six miles north-west of Conner creek, and, if all reports are correct, they have got a big thing there. Col. Estabrook was formerly interested in the Conner creek property, and while he and his associates had control of it they took out bullion to the amount of \$130,000. This money was mainly spent in Baker county, and resulted in the establishment of many improvements which have been of great permanent benefit to this section of the country.

H. B. Frans, who was the original discoverer of silver quartz in paying quantities in Rye valley, has a half interest in two mines known as the Tilden and Pungle, which are situated within three miles of the Weatherby station. He had a crushing of 20 tons of Pungle rock recently at McCord & Long's arrastra, which turned out quite well. Mr. F. is veteran in mining operations. He owns a quarter interest in a mine called the Bobtail, and has been the discoverer of several small veins in the vicinity. He operated in Owyhee with much success from 1864 to 1866, and went to Amelia City in '67. He is now the owner of several good claims in eastern Oregon, and much of the ground which belongs to him can be operated at a trifling expense, picks being the only implements required in working it, and no powder being needed.

One great drawback to the successful progress of mining in this vicinity is the inadequate milling facilities, the arrastra process of crushing being unavoidably very slow, and the wastage considerable. A good five-stamp mill would be of immense service in this section of the district. Mr. Frans located the Pungle on the 21st of July last, and if he has the nerve and pluck to hold out where he is at present, he will make a fortune in a few years.

About two miles from Weatherby station Mr. Thomas W. Porter and his father are running an arrastra which they moved over from Rye valley a short time ago.

James Hart arrived recently from the Heath district, which is about 25 miles from Conner creek. He informs us that a two-stamp mill is being built there and that the machinery is all on the ground for that purpose. It is being built by Messrs. Ruth & Heath who are old operators in that vicinity, and whose enterprise will be the means of keeping several mines in operation there during the winter.

The Jasper mine in Burnt River district has been turning out \$40 rock recently. It was crushed at Stearn's arrastra which is now being worked about a mile from the mine.

M. R. Speelman and J. Daily occupy a cabin together at Conner creek, which is one of the most old fashioned and comfortable edifices we have struck for many a day. The boys are very hospitably inclined. Speelman is an old Owyheeite, having formerly worked at the Silver Cord. Mr. Daily is from the "Hub," we believe, and intends to stick by eastern Oregon until he becomes a millionaire.

Water has been quite scarce in Rye valley during the past season.

A tunnel through Gold mountain would be an immense and profitable enterprise for that section of the district.—*Owyhee Avalanche.*

**SKILLFUL HAMMERING.**—At the Ghent exhibition of industrial art, an interesting collection of articles of new design and execution, one of the most interesting objects was a *grille*, three meters square, executed entirely in wrought iron by the hammer alone. This work of art, which embraces in its composition roses, each with 44 leaves, ferns and lilies, compares favorably with even the best medieval scroll-work. It was designed and executed by M. Wanters-Keockx, of Brussels, who was awarded the first prize, consisting of a diploma, a silver-gilt medal, and 300 fr.

THE cabinet of J. W. Virtue, Esq., at Baker City, embraces the finest collection of choice minerals to be found anywhere on the continent. The entire collection is worth \$10,000. Among the specimens are some rare gems of richness from the Virtue mine, which show amazing streaks of gold, and tell the story of the great wealth of the ledge. Mr. Virtue is very proud of this collection, as well he may be, and takes great pleasure in showing his rare cabinet of minerals and other specimens to strangers.—*Idaho Avalanche.*



## MECHANICAL PROGRESS.

## Notes on the Use of Belts.

A new work on a subject of interest in the machine shop is on the "Use of Belting." The writer is J. H. Cooper, and the following paragraph is quoted from the book: "Special conditions of successful practice, within which is embraced the driving capacity measurable by the area of contact, and modified by the state of the pulley and belt surfaces, and adhesive used, which must not permit the belt to slip or stick; the proper material for and treatment of belts; the utmost contact or arc of enrollment on the pulley; the proportion of diameter of pulley and length and width of belt for best running; the least rounding of the pulley faces, and the greatest smoothness obtainable; the hair side of leather belts always to pulleys, as it is the smoother side, for what is lost in contact must be made up in strain, and because the stronger fibers lie nearest the flesh side, and should be preserved; the amount of adhesion or traction developed by the tension employed; the fastenings, which should be of the best; the disposition of the laps such that the motion of driving will run with not against them; the employment of large pulleys, high speeds, and light belts; the careful putting on and skillful joining of belts; the running of them slack as possible, in the upper fold or strip; the avoidance of tightness by excessive strain or binders, and of lateral straining, as in some quarter-twist methods; the introduction of fly wheels, or like devices, for rendering the work of the belt uniform; the increase of driving capacity, for overcoming occasional resistances and starting frictions; the uniformity of belt section, and weight and the texture of material; the straightness of edges for smoother running at high speeds; the employment of gum belt for elevators, or to run in moist or hot situations, or where uniformity of section, without joints is desirable—in fact, in many places where leather is generally used, always avoiding twists, all devices rubbing the edges, and the contact with any solvent gum; the adoption of leather covering for pulleys, by which 33% of adhesion is gained; the securing of strips to the outer edges of single belts to increase adhesion; the running of a belt atop of another to make it drive; increasing the speed of a belt, which may be as high as a mile in a minute and be safe and advantageous; the introduction of the devices for augmenting the tractive pull of belts; the utilization of belts for imparting and arresting motion; the substitution of "wrapping connectors" for gear, as in twist-belt arrangements, which do not overstrain the fibers; these, and a multitude of other conditions, involving the essential elements of best practice, will be found on examination to be accepted and used by the numerous authorities noted, and to which the reader is directed and assisted by a complete index, arranged especially or ready reference.

**BAD RIVETING.**—A writer in the *Polytechnic Review* states that some time ago having occasion to use some boiler castings with tube-sheets attached, he started to take the sheets off, commencing by chipping, but finding, after a time, that he could save labor by hammering the rivet heads, the result was about on an average, *three blows with a pound and a half hammer per rivet*, to drive it completely away from its head. Now this is what might be called bad riveting, and it was perfectly new, having never been used. The result of a high steam pressure, on such work may readily be imagined. And yet, says the writer, we do not know that there are not hundreds of boilers in nearly the same condition, running very nearly up to their full capacity. Even though the work may not be so bad when new, corrosion will make it constantly worse, when leaks may start, and caulking is of no use; nothing but new rivets will answer. The rivets under discussion, were cut too short in the first place, and consequently the heads were under the proper size; then they were hammered too much, and a crack started around the head, and the whole structure of the iron rivet, as could be seen by examining them after they were removed. A good plan to prevent flawing the head in such a manner (in addition, of course, to good work) would be, to counter-sink the holes in the sheet, on the side of the heading, so as to form a fillet under the head which would serve the same as a fillet in castings, to avoid cracks.

**THE TELEPHONE FOR DIVERS.**—A new submarine armor is exhibited in Cleveland. The body, as described by the *Iron Age*, consists of its steel, while the limbs and helmet are of eaten copper, operating on ball-and-socket joints, overlaid with a coating of heavy rubber. The whole is, of course, water and air tight. To the head piece are two lines of rubber hose, one of these acts as an air supply pipe, and is attached to an air force pump, while the other carries off the bad air and acts as a telegraph wire connected with a telephone. There is a glass window in the fall of the helmet. On pushing the water, although it took five men to lift the armor, it contained so much air that it almost floated. More weight was attached, and it went to the bottom nicely. Here the diver could make himself plainly understood by telephone, but could not hear what was said above. If this apparatus proves to be sufficiently convenient to allow a man to

work in it, it will enable us to make a vast increase in the scope of submarine work. The depth at which work can be performed in an armor of this kind would only be limited by the strength of the material, while at present, with the armor in use, the depth is limited by the pressure which a man can sustain. It is possible that with the improved armor the length of time which a man can work under water will be greatly increased. In some situations it certainly will be.

**NEW USES FOR CAST STEEL.**—We notice by English exchanges that progress is being made in the employment of simple cast steel instead of forged. The first experiments were made a year ago with several eight and ten-inch shells, made out of steel without blows, which had been simply cast, tempered and reheated. These had penetrated armor-plate of a thickness equivalent to their diameter at an angle of 30°. These remarkable results were obtained not only in France, but also by the Italian and Russian navies. In such oblique firing the work of perforation becomes complex. The first action on contact is one of compression; this is followed by a certain amount of flexion, which tends to bring the projectile to a position perpendicular to the plate at the point of least thickness; at last after penetration of the conical head, comes the friction of the cylindrical portion against the rough edges of the hole, which tends to elongate the shell longitudinally. Such a metal resisting both tension and compression against instantaneous deformation is remarkable. Later tests have been as follows: Several pieces one and one-fourth inch square and six inches long were next submitted to the shock of a ball weighing 40 pounds, and allowed to fall from increasing heights. The supports were five inches apart, and rested on an anvil weighing 1,800 pounds. These pieces resisted well, and one of them did not break when the ball fell from eight feet in height, which gave it a bend in center of about one inch. The remarkable result of those first experiments show, if nothing else, that we have had to deal with a metal possessing very interesting and valuable properties, well worthy of the attention of engineers.

**NOTES ON CAR PAINTING.**—We find in the *Car Builder* a report of a meeting of an association of car painters, the following notes on sizing, which may be of use to our decorating workmen. Mr. Bennet had used English Japan gold size in mixing sizing for gold, but found that American sizing was superior, as it had more adhesive properties and the gold stood better on it. Mr. Stines said he also used American size as it made a cleaner edge, which was the only advantage he claimed for it. A gold sizing need not have any wearing properties, as it is more liable to crack. Gold will crack on all slow sizes. Mr. H. C. Burch preferred English Japan gold size clear, as the quicker it dries the better the gold will wear. Mr. Bennet had used a quick sizing on a number of cars, and found the gold was gone when the cars were brought in to be varnished at the end of the year. Mr. McKeon, used a size made with Japan gold size and rubbing varnish, with lead enough to color it. It was medium in drying, and gold stood well on it. Size should be made to dry in not less than five hours, and should not stand over 10 hours. It should dry about the same as the varnish put on over it. Mr. Kirkpatrick did not favor slow sizing, as the gold will crack and flake off on it. Varnish did not wear as well over gold as on color, the reason of which could not be satisfactorily explained.

**IRON SHIPS PLANKED WITH WOOD.**—It has been for some time under consideration by the naval architects of England, says *Iron*, to discover a mode of applying iron and wood in combination with shipbuilding, so as to give them the strength and durability of iron and the buoyancy of wood, enabling the vessel to be sheathed with anti-fouling metal, and, by this means, to obtain greater speed and weight-carrying powers. There has been a vessel of this description lately built in London, by Messrs. Mills and Knight—the *Ury*, a clipper three-masted schooner, of 236 tons register. She is an iron ship, planked with wood from keel to gunwale, which is fastened to the iron by means of wooden bolts with iron heads driven from the inner side of the ship, forming a secure fastening, and preventing all galvanic action, and over this planking she is sheathed with the ordinary yellow metal. Great results are anticipated with regard to speed from this method over the ordinary iron vessel. This method of planking is said to be adaptable for the restoration of old iron vessels.

**COST OF STEEL RAILS.**—The lowest prices for steel rails, says the *Railroad Gazette*, are those bid at the letting of a contract in Belgium, Sept. 5th. About 3,000 tons were wanted, and the lowest bid for the contract was a price equivalent to \$28.32 per ton at the works in Germany (Ruhrort) being about \$30 delivered at Malines in Belgium. The lowest price bid by a Belgian works was \$33. At the same time bids were received for the iron substructure of 30 miles of road of the Hilt system (substitute for wooden ties), and the lowest bid of \$27.16 per ton was nearly \$5 a ton lower than the price asked by the same works a year ago for a similar quantity of the same materials. By the way the quantity required for this substructure was 96 tons per mile.

## SCIENTIFIC PROGRESS.

## The Sun's Distance.

A writer for the New York *Tribune* notes that a somewhat unexpected result is obtained by the reductions of the British observations on the last transit of Venus. The data used are the eye observations (telescopic) in Egypt, Honolulu, New Zealand, Rodriguez and Kerguelen. The photographic observations have not yet been reduced, and there are also eye observations taken in India and Australia that may be utilized, but it is not believed that any great change in the computation will be effected by the figures obtained from the latter source, and the value of photographic observations is as yet an open problem. The new British calculations give for the value of the sun's parallax, 8".760, with a probable error of 0".013. This corresponds to a distance for the sun of 93,300,000 miles, with a probable error of 140,000 miles. The curious feature about this is that it is, in some measure, a return toward the old figures which made the sun's distance very much greater. These old figures from the transit of 1769 were believed to be in error to the extent of three or four per cent. But if the new figures for the parallax be conceded, it will be estimated about midway between the extreme views. The following table will make this plain: in it, No. 1 is Prof. Encke's estimate from the transit of 1769; No. 2, Prof. Newcomb's as used in the *American Nautical Almanac*; No. 3, the estimate of Leverrier adopted by Prof. Hind and given in the *British Nautical Almanac*; No. 4, the recent deductions from the British observations on the last transit:

Estimate.	Parallax, seconds.	Distance, miles.
No. 1.....	8.5776	95,292,000
No. 2.....	8.843	92,381,000
No. 3.....	8.95	91,329,000
No. 4.....	8.76	93,309,000

**GOLD IN THE SUNBEAM.**—Faraday's researches upon the nature of thin films of gold and other metals, and upon the size of finely divided particles of gold diffused through various liquids, are of a most interesting and refined character. Availing himself of the well-known reducing power of phosphorus, he floated small particles of it upon the surface of weak solutions of chloride of gold. In the course of 24 hours he found that the surfaces of the liquids were covered with films of metallic gold, which were thicker near the pieces of phosphorus "possessing the full golden reflective power of the metal," but becoming so thin by gradations, as to be scarcely perceptible. "They acted as thin plates upon light, producing the concentric rings of colors round the phosphorus at their first formation, though their thickness then could scarcely be the 1-100, perhaps not the 1-500 of a wave-undulation of light." By treating very dilute solutions of gold with phosphorus he obtained the metal diffused through the liquid in extremely fine particles, producing a beautiful ruby color. These particles, when in their finest state, often remain unchanged for months, and have all the appearance of solutions, but they never are such, containing in fact no dissolved but only diffused gold. The particles are easily rendered evident by gathering the rays of the sun (or a lamp) into a cone by a lens and sending the part of the cone near the focus into the fluid; the cone becomes visible, and though the illuminated particles cannot be distinguished, because of their minuteness, yet the light they reflect is golden in character and seen to be abundant in proportion to the quantity of gold present. Portions of gold so diluted as to show no trace of gold by color or appearance, can have the presence of the diffused solid particles rendered evident by the sun in this way.

**THE TOAD IN THE ROCK.**—Of the many stories told of finding toads inclosed in the solid rock, none have hitherto been authenticated to the satisfaction of scientific men; but *La Nature* considers that the following case, reported by one of its correspondents, is well vouched for: "In the building of a new chateau in the department of Aisne, materials from the old chateau were used as much as possible. This building dated from the end of the 17th century. One piece of stone had in the middle of one side a large moist portion; it seemed otherwise sound. The stone was sawn to remove the moist exterior (the moisture was attributed to a flow of water into the stone in the old building), and was put in position in a window. Time went on, and the stone (much to the builder's disappointment) did not dry, but presented a villainous contrast to its surroundings. It was at length decided to remove and sacrifice it, in order to find out the cause. On sawing right through the moist part, a large, irregular cavity (about 0.15m. in all directions) was found in the center, and in this cavity an enormous live toad, which by squatting had escaped the saw!"

**SAHARA.**—At a late meeting of the Berlin Geographical Society, a report from Dr. von Barry was read. The *Journal of the Franklin Institute* says: In his excursion into the Tuarez region of western Sahara, he found few grounds to sustain the theory that the desert was formerly the bed of a sea. He inclines to the belief that North Africa has long been free from a covering of water, as no traces of tertiary formations were found, and the sand dunes cannot be regarded as proofs of an ancient sea.

**CHEMISTRY AND EXPLOSIVES.**—In a recent address on the achievements of industrial chemistry, Prof. Abel made the following points in the line of scientific work as applied to explosive compounds: It is to a careful study of the influence which the physical characters of gunpowder (its density, hardness, etc.,) and its mechanical condition (i. e., form and size of the masses and condition of their surfaces) exert upon the rapidity of the explosion under confinement, that we chiefly owe the very important advance which has been made of late years in controlling its explosive force, in its application as a propelling agent, and the consequent simple and effectual means whereby the violence of action of the enormous charges now used in siege and ship guns, is effectually reduced to within their limits of endurance, without diminution of the total explosive force developed. But concurrently with these important practical results, the application of combined chemical and physical research to a very extended and comprehensive investigation of the action of fired gunpowder, has furnished results which possess considerable interest from a purely scientific point of view, as in many respects modifying, in others supplementing, the conclusions based upon earlier experiments and theoretical considerations with respect to the nature and proportions of the products formed, the heat developed by the explosion, the tension of the products of combustion, and the conditions which regulate it, both when the explosion is brought about in a close vessel and when it occurs in the bore of a gun.

**CHEMICAL ACTION ON GLASS.**—In the course of an article on this subject, the *Journal of Chemistry* prints the following paragraph: While, for ordinary purposes, glass is one of the most permanent of compounds, it is not so indifferent to chemical action as it appears. Water acts more or less on all kinds of glass. Faraday found that powdered plate-glass renders moist turmeric paper, showing that a portion of its alkali is readily dissolved out. Pure water, boiled for a long time in glass vessels, likewise becomes alkaline. Mere exposure to moist air gradually causes a decomposition of the surface of the glass, especially when there is ammonia in the air. According to Griffiths, a flint-glass bottle, in which a solution of carbonate of ammonia had been kept for a long time, was so much acted upon by the liquid that flakes of glass could be detached by shaking it. All acids also act upon glass, especially if there is an excess of alkali in its composition, or, as already intimated, if it contains lead. Wine and other acid liquids kept in bottles have often been found contaminated with salts, resulting from the solution of the metals in the glass. Wine is sometimes put into bottles made of glass wholly unfit for the purpose, and its taste and color are affected in a very few days by the salts produced by corrosion. We can imagine that serious mischief might occasionally arise from putting up domestic wines, fruit juice, and the like, in bottles not intended for any such use.

**AN ICELANDIC NEWSPAPER.**—A type foundry in St. Paul has lately furnished the types for the *Framvæni*, an Iceland newspaper, to be published in the Icelandic colony at Keeswatin, on the Red River, in British territory, about 60 miles from Fort Garry. This will be the first newspaper published on the American continent in the Icelandic language. The preparation of the types required the greatest care. They are in the Roman alphabet, but with a great many peculiarities in regard to accentuation, and are of a very antiquated form. The Icelandic language is something like the Norwegian language as it was spoken about 1,000 years ago.

**ELECTRIC LIGHT FOR CITIES.**—*Les Mondes* says that the municipal council of Exeter is the first public body in England which has officially recognized the value of the recent experiments in electric lighting. It has postponed a contemplated purchase of gas works, under a hope that electricity will soon be shown to be more satisfactory as well as more economical. The three rival systems, of the Gramme machine, the Alliance machine, and the electric candles of Jablockhoff and Denayrotze, are continuing their experiments in Paris, on a large scale.

**BRITISH ENCOURAGEMENT TO SCIENCE.**—An influential deputation of members of Parliament lately waited on the Chancellor of the Exchequer, to advocate the claims of the Scottish Meteorological Society. Sir Stafford Northcote said that the treasury was prepared to grant £1,000 for services rendered to the government during the past 20 years; and he gave encouragement for future appropriations.

**AROUND THE WORLD.**—The date of the sailing of the Woodruff scientific expedition is now fixed at October 25th. Only 50 had been "hooked" up to Monday of last week, although the minimum is 250. Gen. Macauley and Mr. Woodruff, however, expect to sail promptly, but in case of failure, the tour will be postponed a year. At least 800 have made inquiries, and over 100 have promised to go. The fee has been reduced from \$5,000 to \$2,500.

**THE CAVE-DWELLERS.**—According to *Nature* Dr. Mitchell, of Edinburgh, places the cave-man in the home rather than the stone age. His weapons were made of bone or horn, and highly finished, while his stone implements were extremely rude. The art faculty and the cranial developments of the cave people, show that they possessed a high capacity for culture.







MINING SUMMARY.

The following is mostly condensed from journals published in the interior, in proximity to the mines mentioned.

California.

AMADOR.

**EADLE.**—Amador Ledger, Oct. 13: This claim comprises a number of small veins opposite West Point on the Amador side of the river. Messrs. Pina and Marchin are the owners. Work has been prosecuted for several years, the result proving very encouraging. Latterly a ledge 2½ feet wide has been struck, 300 feet from the surface. It looks more like a permanent lead than anything hitherto found in that locality. The rock prospects well, but none has yet been milled. The mill will be fitted up and new batteries put in as the season opens next spring.

**THE PHOENIX.**—The Phoenix company are pushing every branch of business connected with their operations. The ditch has been enlarged in many places, where timbers jammed in floating. A strong force is still at work one mile north of town on Indian creek, where the flume passes over the creek. They are building rock piers under the two center braces to support the flume, as the timbers were considered unsafe for the heavy pressure of water.

BUTTE.

**DOUGLAS.**—Oroville Mercury, Oct. 12: We learn from gentlemen living in the immediate vicinity that C. M. Cry, of Eureka, is taking out gold pretty fast from his claims. As there is but little water he has little or no trouble in working it, and it is paying something like \$100 per ton. The Electric mine in that vicinity is also doing well, having got a good piece of rock for crushing, though the vein is not very wide, still it is rich and the prospects are that it will widen out as they go deeper.

The men who have had this in change have shown a good deal of pluck, and are now about to reap a reward for their faithful-

**BUTTE CREEK MINES.**—Butte Record, Oct. 9: We learn from Dr. Brotherton that several claims near the old mining camp of Centerville and Diamondville are paying well. We also learn that Shepherd and others, from San Francisco, having purchased the rights of the Messrs. Elliotts to ditch property in that vicinity, are at work with surveyors running a line for a ditch that will carry water to the high bank of gravel deposits on the west side of the creek, thus giving a chance to work extensive gravel lines upon which water has never before been introduced. We believe the gravel diggings of that vicinity, when supplied with water, will prove remunerative and lasting, and there is no prettier view to be found in that vicinity, which in the course of the water, the creek will open large areas of mining ground that is known to be rich in deposits of dirt. The water will be taken from the creek near the forks of Butte.

CALAVERAS.

**GETTING READY.**—Calaveras Chronicle, Oct. 13: The hydraulic miners in this vicinity are busy making preparations for the winter campaign. Emerson, Voth, Cook, Co., McCann, and a host of others are getting a "good ready," and everything points to the fact that the approaching wet season will be a lively one in a mining point of view. The tunnel miners are also busy. Dureya running levels for the purpose of having extensive "breasts" of gravel opened by the time he can get water to run his mill, and Garland is pushing work rapidly ahead to be in readiness when rain falls. Times will be very busy this winter.

**CLEANING DITCHES.**—The Mokelumne Hill Water Co. has a large force of hands employed cleaning ditch in anticipation of soon having a full head of water. The ditch is cleaned annually, from head to foot, just before winter sets in, the object being to maintain the capacity of the ditch at its maximum. We understand that the water in the ditch is gradually enlarging in volume, the old rights in the ditch are being renewed, and the flow of the springs.

**MOSQUITO GULCH JETS.**—Work is progressing steadily on the San Bruno, with the most satisfactory results. The 200-ft and 325-ft west levels are being run and a fine quality of ore extracted from both. The ledge varies from 2½ to 3 feet in thickness, all good milling ore. There is nothing like 200 tons of quartz now in the dumps. Hauling to Garland's mill has been commenced, and the company has been at work next Monday. The San Bruno has never before so vigorously and systematically worked as it is being at present. Work is shortly to be commenced on the Ood Hope, with the understanding that indications do not prove favorable the machinery is to be removed to the Vance mine. At the Banner the pumps are kept constantly running, the mine not being need of water yet. The machinery now works to it. It will take a week or ten days to finish taking out the water. Everything continues favorable at the Blue Jay. The main shaft is being sunk, the ledge continuing to show the superlatively rich rock that has rendered the mine so famous. The 200-ft level will be run shortly and stopes opened. Then the mine will produce a continuous stream of gold again. Operations at the Monte Cristo continue at about the same pace, the mine being one of the steady paying properties in the district. Cass & Co. and others owning quartz properties in the vicinity of Mosquito are busily at work.

REX.

**REX MOUNTS.**—Inyo Independent, Oct. 13: According to rumor, which we have so far been unable to authenticate, a very rich and extensive strike of ore has just been made in the Rex MOUNTS. The Superintendent, however, as just gone to San Francisco with some parts of the broken water wheel for the purpose of getting it repaired, and probably to induce the company to build a new mill one able to do the work required.

MARIPOSA.

**NEW MINE DISCOVERED.**—Mariposa Gazette, Oct. 13: On Saturday last, the 6th inst., two of our good citizens, Wm. Olmstead and Thos. Kendall, of Cathey's valley, called to see us at our office. They had struck a rich quartz vein over on the Quadoupe mountain, between Bridgeport and Cathey's valley. We were shown specimens of ore which showed free gold in abundance. Johnson had thought the vein for a considerable distance, and is satisfied of its quality and richness, and that it is an unmistakable vein, well defined.

NEVADA.

**RICH.**—Nevada Transcript, Oct. 14: The lode which was under the National hotel, in this city, and on which the Operative mining company have for a long time been running a tunnel, is proving to be very rich. The lode is of good size, is heavily sulphureted, and is liberally sprinkled with gold. One point of dirt taken out from the side of the lode on Friday, yielded \$250.

The North Bloomfield gravel mining company are going to let all the water out of most of their reservoirs this week, for the purpose of having them enlarged and improved.

**THE NEW ENGLAND** mining company are having a large lot of rock crushed. It looks well. The result of the crushing will exceed all former ones.

It is said that Oscar Maltman has sold that big pile of saline sulphurets, in front of his works, on the Orass Valley road, to the Pioneer reduction company. That company propose to work the sulphurets for silver as well as for gold. No attempt has ever been made to save silver sulphurets, in this section.

**THE MURKIN** mining company are taking out some fine looking rock.

**LITTLE YORK.**—John Hussey, of You Bet, was in town yesterday, and he informs us that very extensive preparations are being made in fitting up claims in that township. The mine owners there are never caught out by early rains, for they always take good care to fix up their dig-

gings just as soon as the water gives out. The prospects of that township were never better than now, and unless owners expect, if they have plenty of water, to take out more gold next season than at any previous one for years.

**CENTRAL MINE.**—Grass Valley Union, Oct. 13: The ore in the Centennial mine is of most splendid character. A crushing of 40 loads is now going through the John Smith Orleans mill, and a big result is anticipated. We heard John Trenberth, the Superintendent of the Centennial, propose to treat all hands if the ore were to be crushed and sold next season for \$100 a ton. The Centennial is at the top of Osborn hill, and Osborn hill is full of ledges that are rich in gold.

**HOMEWARD BOUND.**—Foothill Tidings, Oct. 11: The work of drifting goes on uninterruptedly on the second level of this mine, and any day may bring either header—north or south—to a chuto of good ore, though the place cannot be decided by survey, from the fact that the upper ground is so unevenly broken before, was broken. When one of these chutes is out in this level, Homeward Bound will be "on its feet," and from thence on be able to pay its own way, and very soon pay regular dividends. A new move, lately inaugurated, gives greater assurance for the permanency of this mine when the chutes are opened than ever—this being the securing of some adjoining ground, upon which good pay is known to exist.

PLACER.

**CLEANED.**—Dutch Flat Forum, Oct. 11: The South Yuba company's lumes and ditches have already received marked attention in being cleaned after the recent rains, and the company's mines at that point will be worked more extensively the coming season than at any time heretofore. The work necessary to put the Cedar Creek company's ditches in good repair for the present year is under progress of completion, they having less breaks than usual to contend with.

**WHITES IN PLACER OR CHINESE.**—The rumor mentioned in our last, that the Chinese now employed in our mines would be discharged, and the work be done exclusively by white labor in the future, proves to be a fact, providing white labor can be procured at \$35 per month and board. We have had interviews with several of the superintendents regarding this question, and without exception they all tell the same story, which is this: They all claim to be opposed to the bringing of Chinese labor to the mines, and they all claim to be under a tremendous expense in opening up mines which are yet unprospected, if they were compelled to hire labor at the wages formerly paid to miners, they would, in nine cases out of ten, be compelled to shut the mines down. But in order to show their good intent and preference toward their fellow white men, and they think they are as liberal with him as they can, consistently with the chances of the market, they offer to hire them exclusively, and pay them more per month with board than they pay the Chinamen without board. They say they are now determined to have white laborers, if they have to send to the Eastern States to get them; and if failing in that they say they will be compelled to shut the mines down or employ Chinese labor. As regards the boarding of their men, those who are married will be allowed the privilege of boarding with their families, and will receive as much extra per month as the average cost of boarding the miner in the boarding house.

**HAZARD.**—Placer Argus, Oct. 13: The Hazard mine, one mile from Michigan Bluff, of which Col. Keown is Superintendent, will start up about Thursday next. The buildings and works, which were burned down last winter, are now being rebuilt. The claims are believed to be part of the same lode which was burned down, and the mine was regarded as very flattering just before the destruction of its works. They spent \$33,000 in starting the mine in the first place, and they have always been noted for their punctuality in paying up their hands. Before the fire, the company ran the mine for three years and a half by steam machinery. During that time they ran 1,700 feet up the stream from 150-ft shaft. The mine has been drifting since the fire, and the prospects are very rich indeed, and they are driving forward for the wide part of the channel.

PLUMAS.

**SODA CREEK.**—Cor. Plumas National, Oct. 13: The quartz mines of Soda Creek continue to prospect richly. More prospecting is being done than for years, one consequence of the extremely low rate of wages. Some failures are reported, but most of them are believed to be due to management and judgment of lower country "experts" who have superintended them. Among such "bursting bubbles" is at refreshing to know that some legitimate enterprises have been started. Among these are the Plumas ditch and mining company, the East Branch mining company and the Maxwell hydraulic mining company. All these companies' ditches or channels were completed in the next 50 years. The last two named companies have a never-failing supply of water. In this, the driest season ever known, they have been able to run their ditches to almost their full capacity. The East Branch company is operating on Wing hill, the Maxwell company is operating on Hard-rock Point hill, with 60 feet of gravel, which prospects better than anything ever known in that vicinity. Both companies have been at work in the next 50 years. The last two named companies have a never-failing supply of water. In this, the driest season ever known, they have been able to run their ditches to almost their full capacity. The East Branch company is operating on Wing hill, the Maxwell company is operating on Hard-rock Point hill, with 60 feet of gravel, which prospects better than anything ever known in that vicinity. Both companies have been at work in the next 50 years.

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Nevada.

WASHOE DISTRICT.

**CON. VIRGINIA.**—Gold Hill News, Oct. 17: Daily yield, 550 tons of ore, keeping the present milling capacity fully supplied. At the 1750-ft level, the main drift is being pushed steadily ahead toward the west wall of the lode. The face is in ledge matter, but it has evidently not yet reached the west ore vein developed in the levels above. The repairs and enlargement of this drift between the ore vein and the C. & C. shaft were for about 300 feet it passed through swelling ground, which crushed in the timbers badly, is going steadily ahead. Cross-cuts Nos. 2 and 3 on the 1050-ft level the main drift west from the C. & C. shaft is steadily advancing, with the face in poor quartz, porphyry and clay. The various ore breasts and stopes of the east vein, as well as that of the sill floor of the west vein, are showing considerable improvement. The south branch from the C. & C. drift ore stope at this level more ore is being developed in hard blasting rock, needing no timbering. On the 1550-ft level the drift south from the shaft toward the south ore body is making satisfactory headway, and the enlargement and retimbering of the main air gallery at this level will be completed this week. The diamond drill boring upward from this level to tap and draw off the main vein from the south ore stope of the 1400-ft level is expected to effect a raise of very shortly, as it is now running through a heavy calc sand which doubtless holds the water. On the 1500, 1400, 1300 and 1200-ft levels the usual amount of ore extraction and development work is going forward.

**CALIFORNIA.**—Daily yield, 675 tons. The ore stopes and breasts at the 1550 and 1600-ft levels are yielding richly and showing more and more ore as further development is made. Reserves are opening out at the 1650-ft level, showing very much more ore than is required for present use. On the lowest or 1340-ft level the drift south from the Ophir continues following the west wall in very dry, hot ground. On the 1750-ft level the main drift from the C. & C. shaft is still pushing toward the west wall of the lode, with its face in ledge matter, but it has evidently not yet reached the west ore vein developed in the levels above. The repairs and enlargement of this drift between the ore vein and the C. & C. shaft were for about 300 feet it passed through swelling ground, which crushed in the timbers badly, is going steadily ahead. Cross-cuts Nos. 2 and 3 on the 1050-ft level the main drift west from the C. & C. shaft is steadily advancing, with the face in poor quartz, porphyry and clay. The various ore breasts and stopes of the east vein, as well as that of the sill floor of the west vein, are showing considerable improvement. The south branch from the C. & C. drift ore stope at this level more ore is being developed in hard blasting rock, needing no timbering. On the 1550-ft level the drift south from the shaft toward the south ore body is making satisfactory headway, and the enlargement and retimbering of the main air gallery at this level will be completed this week. The diamond drill boring upward from this level to tap and draw off the main vein from the south ore stope of the 1400-ft level is expected to effect a raise of very shortly, as it is now running through a heavy calc sand which doubtless holds the water. On the 1500, 1400, 1300 and 1200-ft levels the usual amount of ore extraction and development work is going forward.

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level, gives good air circulation and increased working facilities. On the 1000-ft level splendid showing of fine ore is developed in the stopes south, east and west, and a large amount of work is being done at this level. On the 1550-ft level good work is being done, with plenty of rich ore in sight. On the 1500-ft level the various ore breasts and stopes are looking finely.

**BALTIMORE CO.**—The pumps and machinery are working finely and the water in the shaft is being steadily reduced. The best prospects exist at the two lowest levels, where the formation is most favorable, and small spots of good ore are encountered.

**YELLOW JACKET.**—On the 2200-ft level the main drift east toward the new shaft is in 420 feet; face in porphyry with seams of quartz. The main drift south at this same level is in 391 feet, the face showing quartz, with small irregular clay seams. At the new shaft everything is working well, the new machinery operating finely in every respect. Sinking the shaft is making fair progress.

**CROWN POINT.**—The principal operations are confined to the old workings near the surface, which are assuming quite a degree of interest, a considerable amount of good milling ore being found, which is being extracted for milling. The ore assays from \$25 to \$40 and the yield is about 100 tons per day. It comes principally from the 1600-ft level, and at the 230-ft level a cross-cut is now being made, to determine whether the ore extends to that depth or not. The water from the 2000-ft level is expected to be turned into the Belcher and Crown Point combination shaft to-day. This water, which has formerly been lifted by the Crown Point pump, will hereafter be taken out by the Consolidated pump.

**JULIA CO.**—Considerable improvement is met with in the prospects at the 1900-ft level, the drift east from the winze having run into good ore. The extent of the ore is not ascertained as yet, but it is an important development. It lies some 425 feet east from the winze.

**BEST & BELCHER.**—Drifting north from the Oould & Curry drift, at the 1900-ft level into this mine, is steadily progressing, and the water in the shaft is being steadily reduced. The best & Belcher is sinking in hard porphyry.

The cross-cut west, near the Consolidated line, on this level, has made excellent advancement through streaks of soft vein material of no value and the face is now in hard porphyry.

**ALTA.**—Cross-cuts Nos. 2 and 3 at the 1050-ft level show improvement. The main drift is making good headway at a lively rate, and in a distance of 200 feet more, or at the 1250-ft level, is expected to cut the ledge again.

**SUTRO TUNNEL.**—The face of the header continues in soft ledge matter, consisting of vein porphyry, quartz and clay, requiring close and constant timbering and allowing of very slow advancement. The tunnel being now over 19,000 feet in length, it is evidently into the eastern outskirts of the Comstock, and can soon be made available for drainage.

**JUSTICE.**—Daily yield, 300 tons per day from the ore-producing sections of the 1000 and up to the 600 and 700-ft levels. Sinking the main incline below the 1150-ft station is progressing well in favorable ledge matter.

**LEVATHAN.**—The water has been lowered sufficiently to permit of work being resumed on the 800-ft level. Cutting out the west side of the purpose of setting an engine, with which to sink the winze deeper. As soon as these arrangements are completed, the water will be taken from the winze and the work of sinking resumed.

**CHOLLAR-POSS.**—Daily yield, 30 tons, the car samples of which assay \$23 to the ton on the average. The old ore sections hold out well and show no particular change worthy of note. On the 1755-ft level the main drift east connects with the Chollar-Norcross-Savage combination shaft is steadily advancing, with its face in hard blasting rock, having 600 feet yet to go.

**GOULD & CURRY.**—The drift connection with the Savage joint winze on the 1900-ft level being completed, the drift is being extended north to the Best & Belcher. A bob-bit, below the 1700-ft level of the main incline, is being cut out for the pump.

**BELCHER.**—Main south drift, on the 1000-ft level, pushing steadily ahead, in promising vein material, with occasional small streaks of ore, and the winze being sunk from 1600-ft level to connect with this drift is being sent downward as fast as is practicable, with a compressed air engine to do the hoisting.

**AMAZON.**—This well known mine at the south end is about to come again into its former degree of prominence. Work is to be resumed in it very soon, all the financial difficulties of the company having been satisfactorily arranged.

**SILVER HILL.**—Sinking the incline below the 800-ft level is being vigorously prosecuted. At this level the drift toward the ore vein is advancing in favorable working ground.

**JOE SCATES AND GEORGE DOUBLAIS.**—The main shaft is now down to the depth of 260 feet, with fine looking quartz formation at the bottom. Three shifts of men are employed.

**SUCCESS.**—The shaft has now attained a depth of 900 feet. The last 10 or 12 feet has been in soft ledge material of the regular Comstock style, with heavy streaks of quartz which give low assays.

**BULLOCK.**—Making excellent progress sinking the main incline, the ground working very favorably with no water to trouble. The east cross-cut on the 1700-ft level is advancing at a good rate in quartz of an encouraging character.

**SOUTH COMSTOCK.**—The drift south, on the 500-ft level, has been advanced 10 feet since last week's report, making a total distance from the shaft of 31 feet; material in face quite hard.

**CON. INFERRAL.**—The winze being sunk from the 2135-ft level to connect with the drift north from the Yellow Jacket 2000-ft level is making good progress downward. Good streaks of quartz are coming in at the bottom.

**SAVAGE.**—All the pump bolts being properly arranged, ballasted and adjusted, the pump started into full successful operation last night, and threw a good full stream, and with the assistance of the Hale & Norcross pump, the water so long flooding the mines is expected to be speedily reduced.

**TROIAN.**—Work is being actively resumed in this mine, the extraction and milling of ore being the first in order. A force of about 30 men are at work running a branch from the Virginia & Truckee railroad and building a dump for this purpose.

**UTAH.**—The drifts north and south on the 1150-ft level are steadily advancing, both in good working ground. The south drift is within 160-ft of the south line.

**WARD.**—Work was resumed at the shaft of this mine day before yesterday. The water is being pumped out and sinking will be resumed to-morrow.

**UNION CON.**—Slow progress is being made in the east cross-cut on the 1300-ft level, the ground being heavy and wet.

**MEXICAN.**—The Mexican and Union joint cross-cuts on the 1405-ft level are being pushed ahead without any change in the formation encountered.

**EXCHEQUER.**—The face of the main combination drift north, on the 2000-ft level, continues in good looking quartz and porphyry, and the east cross-cut gives good assays.

**HOMESTEAD.**—Everything about the mine looking well and progressing as usual. The water in the main shaft has increased somewhat.

**TWIN PEAKS.**—Preparations for further development of the mine are in active progress, the drifts being cleaned out and retimbered, and sinking the shaft deeper about to be commenced.

**HALE & NORCROSS.**—Pump running steadily as usual. It will have more marked success hereafter in assisting to reduce the water, as the Savage pump is completed and running in good shape.

**NEW YORK.**—The shaft has nearly reached the 900-ft level, and the bottom is in very encouraging vein formation.

**EAST ALPHA.**—Work is resumed on this claim, and sinking the shaft will be prosecuted hereafter as energetically as possible.

EUREKA DISTRICT.

**EUREKA CO.**—Eureka Sentinel, Oct. 13: The Eureka Con. keeps up its showing, and is at present engaged in developing one of the largest deposits of high-grade ore ever found off of the Comstock. Leaving out the resources

of the upper levels, which contain rock enough to keep the works running uninterruptedly for months to come, we find on the 10th level an ore body of vast and as yet undiscovered proportions. Since the straightening of the winze between the 9th and 10th, a drift has been run through ore over 200 feet, the face still continuing in high-grade rock. A crosscut north and south penitents 20 feet each way in ore, and a winze has been carried down 50 feet in ore. The connection with the 9th reveals the same state of facts, and proves beyond a doubt the existence of an immense bonanza, that will yield millions to the fortunate stockholders in the mine. The regular \$3 dividend will be declared next week, and as much as \$100,000 carried over to the next month.

**RICHMOND.**—The Richmond, since the termination of the lawsuit, has, as noted in former reviews, vigorously prosecuted work in other portions of the ground, not affected by the decision. At the time of the commencement of the suit, they had the underground workings in splendid order for the economical extraction of the ore that has since fallen into the hands of the Eureka company. Fortunately, without these magnificent reserves, the Richmond is proving itself to be a grand old mine. The development of the bonanza at the fifth level will still continue, and its proportionate value is yet unknown, although enough is in sight to insure a supply for the furnaces for a long time to come.

**K. K. CON.**—The K. K. Con. moves on very steadily, the usual amount of ore, some 90 tons, being extracted and sent to the furnace daily. Prospecting is being carried on in the lower levels. In the seventh level the drift is being carried forward as rapidly as circumstances will permit.

**JACKSON.**—The Jackson commenced extracting and reducing ore the present week, having started one of the Richmond furnaces last Monday. Sixty tons are shipped daily, and the output of bullion has been very satisfactory.

**DECLINED.**—A couple of experts from San Francisco have been exploring the depths of level and shafts of the mine during the week, having been sent here for that purpose. The mine was bonded 30 days ago for the sum of \$70,000, a very low price, considering the developments made in the property. The experts reported \$40,000 worth of ore in sight, and recommended the purchase of the mine at that price, an offer that was promptly declined by the owners, who could see no good reason why they should take that price for a mine that would pay for itself by silver and throwing the mine in. Another offer of \$120,000 has been made for the Bald Eagle, Black Eagle and Gray Eagle, all adjoining mines, and owned by the same parties.

**HAMBURG.**—The Hamburg mine is looking splendidly. The connections with the drift at the 450-ft level and the main shaft were made early in the week, and the thorough ventilation of the mine has been secured by the completion of the work and access afforded to the ore bodies from which the miners were driven by reason of foul air.

At the Hoosac the usual progress is being made, the efforts of the Superintendent being directed to opening up a new shaft and adit, which when finished will open out the mine in much better shape, and allow more economical operations than are possible in the old workings.

HUNTER DISTRICT.

**HUNTER FURNACE.**—White Pine News, Oct. 13: We have been shown a letter here from Hunter district which states that the new 40-ton furnace of the Hunter mine company is in full blast and is producing an entire success. The writer says: "It is turning out lots of bullion."

WHITE PINE DISTRICT.

**THE EBERHARDT MINE.**—White Pine News, Oct. 13: We are informed that a favorable showing for another large ore body in the Eberhardt mine on Treasure hill is being made. It is a continuation of the old chamber worked out last year. The vein that is being followed, and which may at any time open into another large chamber, is five feet wide and 40 feet high, and gives assays of \$50 per ton.

**EXONITS.**—Hamilton is just now undergoing a general clearing out—Eureka being the objective point of most of the work which are leaving. Every day some family take their departure, and at the present rate of migration a few weeks more will leave but few behind. We cannot exactly understand this general stampede, for there is more work being done and better prospects exhibited in the mines of this district to-day than at any time during the past two years.

Arizona.

**TIP TOP.**—Arizona Enterprise, Oct. 10: A. F. Pfister, the assayer, and James Finley, the forman of the Tip-Top company arrived on yesterday's stage, and will leave for the mine soon. This company has now about 70 men employed, and expects to have at least 500 engaged in and about the mine within the next month.

Is the Turkey Creek district some rich strikes have been made within the last few days, and as a consequence the lodes are fast being located, no less than eight claims having been recorded within the last week.

The Masterson mill has arrived, and the frame work is about done. It will be in running order in a short time. We understand that the mill will run on custom ore as well as from the Oodwin.

By last Tuesday's stage the Bank of Arizona shipped two bars of bullion—one 1400.00 oz., 967 fine, valued at \$1,333.69; one 1407.00 oz., 000 fine, valued at \$1,758.09. Total, 2874.20 oz., valued at \$3,591.78.

**SOLIN.**—Arizona Citizen, Oct. 6: Mr. Prontice Head informs us that C. O. Brown has made a sale of the Young America copper mine to San Francisco men for \$5,000 and that active work will be commenced right away. The Young America is situated some 50 miles about west of Tucson.

Mr. Flood, of Kirkpatrick & Co., of Oro Blanco district, was in town this week for some assayer's supplies. He says their mines are entirely satisfactory.

Mr. Davis, of Hays, is in town. He says the Alta. He says there are mine lodes better than ever, and the ore assays up into the hundreds. The company do not yet get satisfactory—although paying—results from the ore. The highest result yet obtained is \$83 to the ton, and double that amount should be saved.

**SAMUEL HUGHES** and others leave to-day for Montezuma district, about 35 miles to the southwest of town, where some extraordinary rich ore has lately been developed in a mine by Mr. Pacheco.

L. M. Jacobs & Co. this week received 32 pounds of silver bullion and \$300 in gold dust from the Santa Rita placers.

Colorado.

**WADES IN SAN JUAN.**—Cor. Salt Lake Tribune, Oct. 13: Having received several letters from the Wades inquiring about the wages paid here for laborers, will you give this space in your paper? It may benefit some who contemplate coming to this overrated mining camp. Carpenters get from \$2.50 to \$3 per day; brick-masons, \$2.50 to \$3 per day. Miners in some instances get \$3 and board, but it is next to impossible to get a situation in a mine. Crook & Co. are erecting a blast furnace, and proposing to get men from Utah to run their furnace at \$3.50 per day. Common laborers' wages are \$2.50 per day, and they have to pay \$7 per week for board. There are 10 men for every vacancy. My advice is stay with the Saints, until the country is better prospectively.

Montana.

**PONY DISTRICT.**—Cor. Helena Independent, Oct. 13: Mallory & Bros.' 10-stamp mill is working on Willow creek and Ned Ores; Oetcheff's 10-stamp is working on Boss Tweed and Keystone; Gormley's five-stamp is working on Last Chance ore; Heston & Bros.' six-stamp is working on ore from the Olden, Eagle, Custer and other claims, on custom work; L. S. Moreland's 15-stamp, steam power, is working on Strawberry and Keystone ores. Lehman's 10-stamp steam mill will be running in 20 days on ore from Metcalf & Co.'s Clipper lode, a 12-inch vein of rich ore, and D. J. Water's Eureka, a 30-inch vein

(Continued on page 252.)



### The Tea Fever.

Interest in the introduction of agricultural novelties is intermittent. Oftentimes the course of agricultural progress is in a circle, and its symbol might be a serpent with its tail in its mouth. New crops and new uses for old crops are continually being agitated, and the series repeats itself with almost the regularity of a repeating decimal. Hundreds of people, with commendable enterprise, embark in novelties which are proposed, and ninety-nine out of each hundred lay aside the venture because it seems at the time clearly impracticable, by reason of some existing difficulties. The last man or woman in each hundred clings to the novelty, carefully propagating it, and diligently caring for its products, in the hope and belief that the end will yet be in success. Something like this is the history of the tea plant in this country. Although 20 years ago the subject was agitated violently, and special experts were sent at Government expense to spy out this great industry of the Chinese, the growing of tea scarcely went further than the paper on which the accounts were written, so far as the actual outcome of the real drinkable material was concerned. Plants were grown successfully on this coast, and in some of the Southern States, and tea was made from the very expensive leaves by a very expensive method, because of the cost of labor. This has been done for the last 20 years, and is done to-day by those few, who, either from the interest in the culture, or some confidence that the industry would ultimately prevail, have cherished their plants.

It is now evident through notes which we see in the newspapers and from practical growers with whom we have come into contact that the tea fever is likely to break out anew. It is hardly likely to create such wide interest as it did a score of years ago, and all anticipations must be somewhat modified by the experience which has been gained. But there is a firm belief in some quarters that the problem has not yet been demonstrated adversely, although many experiments have failed for various reasons.

Those who are now advocating the re-opening of the case in favor of the convicted Bobea, propose to meet the labor difficulty by throwing aside the magnificent idea of extensive plantations and welcoming the tea plant to the gardens of the States where conditions are favorable for its growth. Let there be grown, say they, enough plants to supply the family demand for tea, and let the leaves be gathered and prepared by the housewife and her assistants just as the winter supply of sage or summer savory used to be cherished by our grandmothers, before the Quakers began the business of compressing a week's supply of catnip into a space as large as a yeast cake. Let the size of the tea plantation be according to the numbers of unemployed hands there may be in the farmhouse at the time for picking; in other words, let the farmer plant as many tea shrubs as he has unmarried daughters, or a certain number for each of these waiting beauties, and twice as many for each that has passed the age for matrimony—in short, allotting the plants according to the usual devotion of each for the plant and its products. Thus indeed would the labor difficulties be done away, and thus, by making each tea consumer answerable for his or her own supply, would the importation of tea be diminished by millions of pounds annually.

Inasmuch as tea is coming up anew, and we bear indirectly that the new Commissioner of Agriculture proposes to take up the subject for renewed investigation, we have reproduced the map which was drafted 20 years ago to serve as a basis for computing the probable tea area of this country. Readers will notice that it was drawn before some of our flourishing States were carved from the territorial expanse; but it will serve to give an idea of the regions which on theoretical grounds were denominated the tea regions of the United States. It may be well to hear this diagram in mind should the interest be reawakened, as now seems probable. It need only be said that in many of the parts indicated on the map the tea plant was found to grow well in practice when intelligently cared for, and in some there were failures. In Georgia, and perhaps in other Southern States, there may have been plants in growing ever since the early importation by the Government, and

tea is made for home use from boms-grown leaves. In our own State several parties have the trees in growing, and its adaptation for growth seems demonstrated. The matter is of interest certainly, and of how much practical value it can yet have made remains to be seen.

### The Gold Hill Mine, Idaho.

A correspondent of the Idaho *World* writes of this mine as follows: Being a searcher after information to lay before the readers of the *World*, concerning the resources of our county and Territory, I asked and readily obtained permission to enter this mine, and, accompanied by William Coughanour, one of the owners and Superintendent of the same, have been through its tunnels and stopes that are now being operated. As the mine has been worked continuously for a period of 14 years, there are some tunnels and drifts worked out near the surface that are of no interest to the reader, and will be passed over in silence. I will state in the beginning that there are but three owners in this mine, Thos. Mootry, and David and Wm. Coughanour; that a large sum of money has been expended in erecting the best class of machinery for hoisting and working the ore, the mill for the latter purpose being of good capacity, running 25 stamps and being provided with every facility and convenience for the successful working of gold rock,

work of sinking will commence, which will not interfere with the work of hoisting ore and reducing it. Although a considerable sum of money has been expended in preparing this mine for work, it is an important fact that no assessment has ever been levied since crushing commenced. This single mine has given life and vitality to the part of Boise county in which it is located, and appears now to be in better condition and more reliable as a permanent mine than ever before. They have had their drawbacks in the way of lawsuits and questions of title incident to all rich mines, but these difficulties are all of the past, and all is clear sailing now, with an established wealth and permanency beyond dispute. This is not the only rich mine in Boise county, but it is the best established and best proved mine in Idaho Territory, and the management is worthy of note.

### Humboldt County.

The resources of this county are as varied as they are extensive. The territory within her borders is sufficiently large to form an empire, being about five times as large as the State of Rhode Island, or two and one-half times as big as Delaware; possessing a sea-coast of about 125 miles, with several good harbors, among which may be mentioned Trinidad bay, which would be one of the best harbors of refuge for steamers and vessels to put into in case of distress if a breakwater or sea wall were con-

### Tuolumne County Mining Interests.

The following sensible article which will apply as well to other localities, is from the *Union Democrat*: Where so much mineral value exists as is found in Tuolumne county, there should be no end to persistent efforts to bring that value to the notice of the world, to make the vast treasure house yield its wealth and build up this section amid which it is situated. There are innumerable gold-bearing veins that are rich, and can be made to pay large and handsome profits if properly worked and handled. The great trouble is that few wish to work a mine unless a company is formed, some to work, some to pay assessments, and others to get a profit out of the cost of developing and improving. In nearly all instances where a few men have taken hold of a vein, and did with it as a farmer does with his farm, or as a legitimate tradesman or artisan does with his business, they have received a good return for the labor and money invested. Because a number of mines conducted on the "big augur" principle failed to put money in the stockholders' pockets, is no proof against the great value of the mines in this county. There is enough of them to employ several thousand men, if they will work prudently, with judgment and economy. Grand failures have not only tended, but have actually destroyed the reputation of Tuolumne for vein mining. This is all wrong, gold is not to be found here lying loose on the ground, neither is it to be picked out of the vein with the fingers, but it can be as easily obtained as in many other places that are held in high estimation.

### Now why is this?

Do our own people give proper encouragement? What amount of the huge sums taken out of our mines has remained here? Go ask the speculators and savings banks of San Francisco. Where is the army of men that realized fortunes out of the mines, mercantile business, and in other ways, from the natural resources of Tuolumne, where is their wealth? They and it have gone elsewhere to create property with the means drained from these hills. How many of you that are left with means are now crying "hard times" and giving no encouragement to our mines, but have locked your money up in savings banks, thus depriving the home you live in of powers of recuperation? How many of you close down the light of day on every dollar you obtain above expenses, drawing like a blood-sucker on the vitals of the county that gives a living easier than any in the world, and then depriving it of that nourishment which of right and duty you should bestow. This sponging must be stopped; you must change and give a hand to help along and encourage our mining interests, which you can in many ways. Help to redeem the unjust name that now attaches to your mines. You who put every dollar beyond your touch and then cry out loud and long for a railroad, with no intention of aiding or assisting the project only with your lungs and tongues are the worst enemies the interests of this county have. Draw your money from the savings bank, loan and invest it in your own county, then you will advance its prosperity, give her people an opportunity to make property, draw towards you a larger population, increase your own wealth and that of those around you. An empty bag will not stand alone. If every dollar made is immediately sent away, how in heaven's name can the county become any better? Quit making money bags of yourselves, and use your money in home investments. If this is done by all these depositors, they will realize a better rate of interest and in this way extend an aid that will insure a railroad; with a railroad the mines will be brought nearer capital and thus that interest will be advanced. Let the money that legitimately belongs to Tuolumne people be placed and used where it belongs, and all the advancement and improvements will come naturally; that too, without expense to those who will create this needed base to give this start to success.

**RECOVERY FOR PATENT INFRINGEMENT.**—In the United States Circuit Court, Judge Sawyer has given judgment against Joseph G. Eastland et al. (which is virtually against the city) for \$5,190, and in favor of the Pacific Submarine and Earthquake Proof Wall Company, for infringement of their patent. The infringement consists in using their system of horizontal and vertical rods in the walls of the new City Hall.



and that 50 tons per day is its capacity. The ore is hoisted through an incline of 45° 142 feet, the mine being now worked 100 feet below water level and to a depth of between 500 and 600 feet below the surface of the hills. After being lowered in a car to the foot of the incline, 60 feet took us to the point where the tunnel taps the lead running northeast and southwest. Here two tunnels diverge, one running west, or nearly so, on a small vein for a distance of about 150 feet, and the other bearing southwest about 350 feet along a main vein of good quartz, to where men were at work stopping. At the end of this tunnel the load of pay ore is about two and a half feet wide, from which we carried a handful to the surface, and after pounding it in a mortar obtained a handsome prospect of free gold. We crawled into the several stopes along the line of this tunnel, and everywhere found a good-sized vein of good ore. After examining this part of the mine for a distance of nearly 500 feet from the bottom of the incline west, we went through the old tunnel east a distance of 1,200 feet. This tunnel has been run along the ledge into the mountain until its depth beneath the surface has reached about 600 feet. A large portion of this has been stoped out, but still there is a large amount of ground to be stoped on this line, and in some of the works between the 100-foot level and the water level as rich ore is now being taken as ever came out before in quantities. Having explored a large subterranean area, we returned to the foot of the incline, placed ourselves in a car, rang the bell, and were hoisted to the surface in safety, having seen a vast amount of auriferous quartz. The company have worked the lead for a distance of 1,200 feet east of the hoisting works. As stated this mine has been tested to a depth of 100 feet below water level and found good. The prospects are better now than ever before in the history of the mine, for it is a settled fact that it is a true fissure vein, and is increasing in size. It is more regular in pay, while its continuity is settled beyond a peradventure. The company will sink a 150-foot level this fall, and for that purpose have ordered a new boiler to give increased power, and a Wilcox pump capable of hoisting water 250 feet, and as soon as they arrive the

structed from the light house point to what is known as Trinidad head—a large rock which stands out in the ocean about half a mile from the main land. This work will eventually be done by the National Government. The cost will not be great, and the benefit will be incalculable. The town of Trinidad has two saw mills, which employ, directly and indirectly, something over 100 men. Humboldt bay, situated about 25 miles south of Trinidad, is the best harbor in the State of California north of San Francisco. This beautiful bay is about 25 miles long by from three-fourths to six miles wide, and is one of the prettiest sheets of water in the State. At the head of this bay, or rather on the north side of it, is Arcata, beautifully situated, bounded, as it is, on three sides by a rich valley, called the Arcata bottom. This is one of the most fertile tracts of land on the coast, and produces immense crops. The landscape, as viewed from this town, is picturesque in the extreme. The immense flat, or bottom, as it is called, with its green and waving fields of ripening grain, its neat farm houses and dense redwood forests in the distance make it one of the most delightful landscapes. This charming little town has three saw mills, three churches, many stores, a telegraph office, good schools, and everything that could be desired to make it one of the most charming little towns in the State. Eureka, the county seat of Humboldt county, is situated on this bay, about six miles from the entrance, and about 12 miles south of Arcata. It has about six thousand inhabitants, is governed by a mayor and common council, has seven saw mills, churches for nearly all denominations, good public schools, two seminaries for young ladies, business places of every description, and is the most thriving town in the northern part of this State. It is surrounded by dense forests, and is in every way a prosperous place. Table Bluff, Springfield, Rohnerville, Hydenville and Ferndale are all prosperous places.—*Democratic Standard*.

A horse owned in Baltimore seizes the rats that come into his trough by the hack, and one grip with his teeth settles the case. He catches from three to six every night.



## Eureka District.

The month of October has opened very bright, and the presence of the pay-days, with the largely increased amount of coin put in circulation over that of former ones since the first of the year, is a very encouraging feature, and one calculated to infuse new life into all industrial and mercantile circles. The full benefit has not yet been felt, although the miners and laborers have distributed a large amount of money in paying off old scores and squaring up accounts. The money locked up in coal receipts—and there are very few business men in Eureka who do not hold some of these collaterals—will be loosened by the beginning of the week, and at least \$250,000 will be paid out in redeeming these evidences of indebtedness. Counting up the items of labor, coal, wood and other supplies, at least \$500,000 will be paid out by local companies between the 1st and 10th of the present month.

In glancing at the mining outlook, any one acquainted with the situation will pronounce it the brightest in the history of the district. Not only are the older mines being vigorously worked, but a large amount of prospecting is being carried on, those engaged in that work being encouraged by the fact that deep mining has proved to be the one thing necessary to develop the permanence of the vein, and that the lode shows as well at the lowest depth worked as at the croppings or near the surface.

The Richmond company have made some important developments, having, during the past week, uncovered a splendid deposit, and one that promises to be as rich and of as great extent as any ever found in the mine. The richest of this ore is being sorted in the mine, and is sent to the reduction works in sacks, so as to prevent waste in transportation, while that brought down in the ordinary way is far above the average in value. It is probable, as explorations are carried forward, that the ore body will be found to extend downward to, and below the sixth level. The section of the mine where these operations are being carried forward is ground never before touched, except in the running of air drifts, and the company, in consequence, have a right to look for the best of results.

At the Eureka Consolidated about 200 tons of ore are extracted daily, and the full reduction capacity of the company is employed in smelting the ore. This quantity makes no impression on the vast deposits in sight, and there is no apparent diminution in the reserves. The output does not come from one level by any means, but is broken down from the fifth to the tenth levels, and this great bonanza, developed by Superintendent Donnelly, is connected for a distance of 600 feet, and how much further it penetrates in depth can only be ascertained by future exploration. A number of the largest stockholders in the property have visited and examined it during the past two weeks, and all unite in pronouncing it a wonderfully rich mine, and the most valuable of any on the coast with the possible exception of two on the Comstock. The production for the month of September was something over \$300,000, and this return was necessarily limited to the smelting capacity.

At the K K the usual amount of work is being done with the same results. The output of the mine is very regular and of sufficient quantity to keep the furnace in constant operation. Superintendent Arrington is carrying on operations very systematically and with a view to the future. The output of ore comes from the fourth and fifth levels. On the seventh a drift is being run to the southeast, and there is every indication that the old ore body will be found making downward. Mr. Porter, an experienced smelter, has taken charge of the furnaces, and under his supervision everything is working very smoothly. The company average about four shipments of bullion per week.

At the Jackson the recent improvements—branch railroad, ore dumps, etc.—will aid very much in the economical working of the property and facilitate operations.

The Connolly mine is looking exceedingly well, and the same can be said of its neighbor, the Industry. Shipments of ore from the latter are being made to the Metamoras furnace. The connections between the main shaft at the 450-foot level, and the 600-foot east drift from the Friday shaft, was made at the Hamburg, and the ore body at that point uncovered. It is not probable that any ore will be reduced this season, but everything will be put in shape for vigorous work next spring.

A large amount of dead work is being done at the Hoosae, and the new shaft is going down steadily. Men are at work cleaning up and putting the old workings in order. There is considerable ore on the dump, and some good bodies in the mine.

The Metamoras furnace is well under way and will be completed by the 1st of November. A hoisting engine, rock breaker and sampling machinery has been shipped from Chicago, and will arrive next week. The new tramway will follow, and everything will be in position to commence operations by the above date.

The usual amount of work is being done on the outside mines, and large quantities of ore arrive at the furnaces from these sources. Summing up the situation, there is every promise that the winter season will be an unusually busy one, and Eureka district will be second, in life and activity, to none on the coast.—*Sentinel.*

## USEFUL INFORMATION.

## Color in House Furnishing.

From a recent lecture on "Industrial Art," by Charles L. Eastlake, we take the following paragraph: While on the subject of color, I cannot help saying that the more I study its effect and value, whether in pictorial or decorative art, the more convinced I am that its application will be found more harmonious in instances where one dominant hue is found to which all others are subordinate. You have all heard of that famous picture, "Gainsborough's Blue Boy," which is the delight of every painter and connoisseur. Now why has this portrait such extraordinary attraction? Chiefly, I venture to think, because it has this quality of chromatic unity. You recognize it at once as a blue picture, I don't mean that it is all indigo or cobalt, or French blue, or Prussian blue. It may pass from one to another of these shades, and include gray, white and green. You may get warmer hues of pink and brown in the flesh tints and background, by delicate contrast, but the prevailing tone is definitely blue.

Well I think that our rooms should be decorated on this principle, not in the upholsterer's sense of harmony by covering all his furniture with stuff cut from the same piece, and by hanging up curtains to match, but by making one color dominant and ringing in a variety of changes on it. In this way yellow might lead up to green, silver gray up to purple, and Venetian red up to brown, but the subordinate tints in each case should have a certain affinity to the dominant color, and when you have settled all this you will find that any little bit of contrast introduced provided it be unobtrusive, and does not interfere with your scheme, will have a cheerful rather than a discordant effect. And this principle concerning the decoration of a room may be safely applied, I think to all departments of design in which the element of color is a leading feature; as for instance, in textile fabrics, paper-hangings and the surface patterns of pottery and china. Wherever you find two or more colors introduced in such even proportions that you are puzzled to know which rules, so to speak, be sure the design is bad.

HOW FINE DARK CIGARS MAY BE MADE.—According to a little brochure, published lately by M. Haase, cigar manufacturer in Bremen, and reviewed by the *English Mechanic*, the artificial coloring of cigars is daily becoming more common. Most of the smoking public prefer strong and dark-colored cigars to the light and bright-colored. M. Haase reports that 76 per cent. of his purchasers order the former, and only 24 per cent. the latter. It is further known that most cigar-smokers prefer a cigar of a regular brownish color to an irregularly-colored, red, dun, or spotted cigar. On the other hand, the color of raw tobacco tends rather to bright than to dark, and the bad crops of the past year have furnished much bad-colored tobacco. Hence, with an increasing proportion of bright-colored and bad-colored tobacco, and the demand for the dark tobacco, the use of coloring sauces has increased. These sauces are all of pretty harmless ingredients, generally some dilute dye-wood extract in ammoniacal solution; but, indeed, these extracts contain no natural tobacco color. M. Haase condemns the practice; any artificial alteration of a natural product, like tobacco, in order to give it a better look, is in itself improper. Then the natural color of the covering leaf is of essential influence on the strength of the cigar, and most smokers lay great value on the color. But, with artificial coloration, the judgment is deceived, and a right inference from the external color to the quality of the cigar rendered impossible. Rubbishy cigars can, by coloring, be passed off for good. Hence all artificial coloring of cigars with such sauces must be regarded as a falsification of the goods for deception of the public.

FELT MATS.—The *Western Manufacturer* says that mats and rugs for carriage doors, etc., are now made of felt by the following process: A piece of felt of suitable thickness is cut into strips three to five-eighths of an inch in width, and as long as the mat is to be wide. These are laid side by side on edge, and holes are made through them, and through these holes cords of fine wire are passed, and the strips are then drawn tightly together and fastened in place at each end of the wires. This gives a fabric as thick as the strips are wide, and of a light, flexible and elastic character. The strips may be in various colors and may be disposed in any desirable pattern. These mats are reported to be strong and durable and able to resist heat, cold, dust and severe usage. The color keeps well because in dyeing the felt before the strips are cut a uniform color may be obtained, and when finished the mats have a good face on either side.

A NEW USE FOR OLD CORKS.—A patent recently issued in France gives the following process for manufacturing cork pasteboard: "Ground cork is thoroughly incorporated in paper pulp by means of mixing machines and very powerful presses. The board so formed has all the water pressed out and is dried like common paper. Old bottle corks, sole-shippings, and cork in other forms can thus be utilized. The pasteboard is springy, light, a poor conductor of heat and sound, as well as possessing other properties given it by the cork."

REFRIGERATOR CAR FOR EXPLOSIVES.—Mr. Mowbray, of North Adams, Mass., says the *Iron Age*, has just shipped in a refrigerator car 10 tons of mica powder to Fort Francis, 200 miles east of Winnipeg, a part to be used on the Francis canal and a portion on the Northern Pacific railroad of Canada, at Kewatin. The rock is so hard at both these points as to require an explosive of greater disruptive power than gunpowder, and this mica powder appears to answer the purpose exactly. The car used has been built for this particular purpose, it being necessary to maintain a temperature below 50° or 60°. The thermometer in this car has registered from 39° to 41° on the whole trip. This mica powder consists of tri-nitro glycerine and scales of mica, or Muscovy tale, in nearly equal proportions, and the object of a low temperature is to congeal the tri-nitro glycerine, which in this condition is absolutely non-explosive, and may be transported as safely as a box of soap. Two messengers, necessarily experienced in handling this powder, always accompany the car, in which a comfortable apartment has been provided for them. Their duty is simply to watch the temperature. In case of a smash-up, even, the cellular construction of the car renders explosion impossible, and if thrown on the fire of a locomotive there could be nothing more serious than a rapid burning of the powder.

THE PRESERVATION OF WINE WITH SALICYLIC ACID.—Prof. Nessler, of Carlsruhe, has discovered a means by which wine can be preserved by means of salicylic without necessitating a mixture with the same. He recommends the use of molten paraffin, containing two per cent. of salicylic acid for the saturation of small sticks of wood or cork, say of 15 m. m. length and two m. m. thickness, which are to be thrown on the surface of the wine, and thereby prevent the formation of mold. Experiments showed that wine, which would ordinarily spoil on an exposure of eight days to atmosphere, was with the addition of the wood particles so prepared, perfectly clear and sweet, even after an exposure of four weeks. If the mold has already been formed the addition of alcohol effectually kills the same, and causes it to fall to the bottom of the vessel. The addition of the salicylic acid in the way described prevents further formation. The cost of this preserving wine would not exceed 15 to 20 cents per barrel.

## GOOD HEALTH.

## How to Take Care of the Teeth.

Some time ago the Odontographic Society of Philadelphia offered a prize for the best essay on the care of the teeth, the same to be published for the benefit of the public.

The prize was awarded for the following rules for preserving the teeth:

1. Cleanse your teeth once, or oftener, every day. Always cleanse them before retiring at night. Always pick the teeth and rinse the mouth after eating.
2. Cleansing the teeth consists in thoroughly removing every particle of foreign substance from around the teeth and gums.
3. To cleanse, use well-made brushes, soft quill or wood toothpicks, an antacid styptic toothwash and precipitated chalk. If these fail apply to a reliable dentist.
4. Always roll the brush up and down lengthwise of the teeth, by which means you may avoid injuring the gums and necks of the teeth, and more thoroughly cleanse between them.
5. Never use a dentifrice containing acid, alkali, charcoal, soap, salt or any gritty or powerful detersive substance.
6. Powders and pastes generally are objectionable. They injure the gums and soft parts of the teeth, and greatly assist in forming tartar. A wash, properly medicated and carefully prepared, is pleasanter and more beneficial. It dissolves the injurious secretions and deposits, and the whole is readily removed with the brush and water.
7. Avoid eating hot food. Thoroughly masticate and insalivate the food before swallowing it. Frequent indulgence in sweetmeats, etc., between regular meals disturbs the process of digestion, and a viscid secretion is deposited in the mouth (from the stomach) which is very injurious to the teeth.
8. Parents, carefully attend to your children's second dentition. Gently prevail upon them, at an early age, to visit at frequent intervals a careful and skillful operator.
- Remember that four of the permanent double teeth come in at about the age of six years. They are very liable to decay early, are very large, and should never be allowed to require extracting.
- Children do not "shed" their teeth as they did in former ages. Instead of being trained to masticate nutritious food, they are tempted with and allowed to "gulp down" delicacies, hot cakes, hot beverages, etc.
- Thus, by depriving the teeth of their natural function and overtasking the stomach, a morbid condition of the general system is produced; the "first teeth" are prematurely decayed, and the permanent set are not matured at the proper period of dentition. The consequences are terrible.
9. Never allow any one to extract a tooth or to dissuade you from having them filled, unless absolutely necessary. Many so-called dentists, actuated by selfish motives, advise extracting, and sacrifice teeth which competent operators

can render serviceable for many years.

10. Carelessness and procrastination are responsible for a large majority of teeth that are lost.

## Marriage of Relatives.

There is a good deal of confusion in the minds of physiologists touching the effects of intermarriages between relatives. In the plant and animal creation it is noticed that interbreeding generally has good results, and it is very certain that in some cases the marriage of cousins results happily in the matter of offspring among the human species. It is, however, quite true that in the majority of cases the offspring of children of cousins are defective, and public opinion in consequence declares against such unions. This topic, says the *New York Graphic*, is again being discussed on account of the following statement which has been widely published, touching the celebrated naturalist, Darwin:

"Darwin married his cousin. His eldest son, William Darwin, is a banker at Southampton; the second, George, took high honors at Cambridge, and is now a fellow at Trinity; the third, Frank, who has inherited his father's ill health, acts as his secretary; the fourth, Leonard, is an officer in the artillery, and distinguished himself as one of the scientific corps sent to observe the transit of Venus; the fifth, Horace, is an excellent mathematician. One married and one unmarried daughter complete the family."

The rule with regard to the interbreeding of either men or animals seems to be this: Strong and robust parents, if of allied bloods, are likely to have children in every way superior to their progenitors, while weakly or diseased parents, if cousins, are almost certain to have defective offspring. In other words, nature, in the intermingling of allied bloods, intensifies the ruling peculiarity, whether it be strength or weakness. The bulk of mankind is imperfectly bred, and as a consequence, the children of people allied in blood are liable to be insane, blind, deaf, crippled, or in some way diseased. When, however, as seems to be the case with the Darwin family, parents are exceptionally healthy, or robust, the offspring is benefited by the union.

## Copperas as a Disinfectant.

Copperas (sulphate of iron) is largely used as a disinfectant for the miasmatic exhalations. According to some researches into its use by the *Polytechnic Review* it is of doubtful value for such purposes. It claims that the sulphate of iron, first of all, unlike the chloride of lime, is not a hygienic disinfectant. Although it is poisonous to higher forms of life, there appears to be no evidence that it acts destructively upon the lower forms of organisms, as does the chloride. One of the best illustrations that can be offered to prove conclusively that the sulphate is not a poison to the minute life forms, developed during putrefaction and decay, is afforded by the strong disposition of our common writing inks, most of which contain it in quantity, to become moldy, such mold being, as is doubtless well known, a fungus vegetation, which often appears on bodies in process of decay. We may designate the virtues of the sulphate of iron, for disinfecting purposes, as follows: It is not a hygienic disinfectant, since it does not destroy the lower forms of life. As a remedy, therefore, against the spread of epidemic diseases, which spread by the dissemination of the germs of such minute organisms, it is quite useless. As a chemical disinfectant, however, for the suppression of offensive odors, affecting the question of comfort rather than health, it is a most excellent agent. Wherever the ordinary system of a walled reservoir for holding excremental matters is in vogue, and where, as is generally the case, the reservoir is but seldom emptied, the air in the vicinity, especially during the period of low barometer, will be charged with pungent and offensive odors. These may be effectually checked by the periodical addition of the sulphate in solution in water.

EUCALYPTUS TEA.—Mrs. Fuller, of the Eisen farm, informs the *Fresno Republican* that she makes, daily, a pail full of tea from the leaves of the blue gum tree, and that all the men about the place drink some of this every day. There is not now, nor has there been any malarial sickness on this ranch during this season. We know of our own personal knowledge, says the *Republican*, that there were several cases of intermittent and bilious fevers on the same place last year. Irrigation is extensively practiced, and last year a large body of water passed through the ditch, which raised the water in the well, and also afforded a fine opportunity for frequent bathing. Some of the hands carelessly drank water from the ditch, and sickness followed in consequence. The absence of wind last season gave miasmatic poisons a better chance to generate than usual, but still we feel satisfied there need not have been more sickness than usual last year. The drinking water used this season is first boiled and then allowed to cool. The place is kept clean and in perfect order, and all hands take a little blue gum tea daily. The prophylactic and curative properties of the Australian *Eucalyptus Globulus* are well known to medical men, and different preparations of it are often prescribed. It grows thriftily in this climate, and no better preparation can be made than a tea made from the leaves, which, however, should steep, not boil, as boiling drives off the volatile oil which gives the plant its aroma and medicinal virtues.





W. B. EWER.....SENIOR EDITOR.

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SAN FRANCISCO:

Saturday Morning, Oct. 20, 1877.

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## The Week.

The week has been devoid of interest as far as matters connected with mining are concerned. The meeting of mine Superintendents at Virginia to take into consideration the questions relative to the Suro tunnel, which is referred to elsewhere in this issue, will probably have the effect of definitely settling the matter. The principal topics of interest in the city of late have been the status of the savings banks, but now that the weak ones have been weeded out, the others can do business on even a firmer basis than before. Nothing does so much injury as lack of confidence in the savings banks.

The miners all over the State are busy preparing for the rapidly approaching winter and expect rain almost every day. The hydraulic claims are all in first-rate condition, the men having had time to get them in good order. The present year having been a very dry one, many quartz mills which run by water supply are now compelled to shut down until the rains come, the water power almost everywhere having given out. The mining communities are anxiously awaiting good, hard rains, so that they can set to work in earnest.

The lumbermen in the vicinity of Dutch Flat, Placer county, have resolved to discharge all their Chinese help from the saw mills as fast as white labor can be found, to take their places at \$35 per month and board.

## Amount of Ground Subject to Location.

## Quartz Mines.

The United States mining laws provide that after May 10th, 1872 (the date of the passage of this law), any person who is a citizen of the United States or who has declared his intention to become a citizen, may locate and hold a mining claim of 1,500 linear feet along the course of any mineral vein or lode subject to location; or any association of persons, severally qualified as above, may make joint location of such claim of 1,500 feet; but in no event can a location of a vein or lode, made subsequent to the date mentioned, exceed 1,500 feet along the course thereof, whatever may be the number of persons in the company.

With regard to the extent of surface ground adjoining a lode or vein, and claimed for the convenient working of the same, the Revised Statutes provide that the lateral extent of location, made after May 10th, 1872, shall, in no case, exceed 300 feet on each side of the middle of the vein at the surface, and that no such surface rights shall be limited by any mining regulations, to less than 25 feet on each side of the middle of the vein at the surface, except where adverse rights, existing on the 10th of May, 1872, may render such limitations necessary; the end lines of such claims to be in all cases parallel with each other.

By the foregoing it will be seen that no lode claim, located after May 10th, 1872, can exceed a parallelogram 1,500 feet in length by 600 in width, but whether surface ground of that width can be taken depends upon the local regulations, or State or Territorial laws in force in the mining districts; and that no such local regulations, or State or Territorial laws, shall limit a vein or lode claim to less than 1,500 feet along its course, nor can surface rights be limited to less than 50 feet in width, unless adverse claims, existing on May 10th, 1872, render such lateral limitations necessary. It is provided by the Revised Statutes that the miners of each district may make rules and regulations not in conflict with the laws of the United States, or of the State or Territory in which the districts are situated, governing the location, manner of recording, and amount of work necessary to hold possession of a claim.

In order to hold a possessory right to a location, made prior to May 10th, 1872, not less than \$100 worth of labor must be performed or improvements made thereon, within one year from the date of such location, and annually thereafter; in default of which the claim will be subject to relocation by any one else having the necessary qualifications, unless the original locator, his heirs, assigns, or legal representatives, have resumed work after such failure and before the relocation. The expenditures required upon mining claims may be made from the surface or in running a tunnel for the development of such claims. The act of February 11th, 1875, providing that where a person or company has run a tunnel for the purpose of developing a lode or lodes, the money so expended shall be considered as expended on the said lode, and the owner or owners shall not be required to perform work on the surface to hold the claim.

## Placer Claims.

The laws provide, also, that no location of a placer claim, made after July 9th, 1870, shall exceed 160 acres for any one person or association of persons, which location shall conform to the United States surveys. All placer claims, located after May 10th, 1872, shall conform as nearly as practicable with the United States system of public surveys, and no such location shall include more than 20 acres for each individual claimant.

These provisions of the law are construed by the Commissioner of the General Land Office, to mean that after the 9th of July, 1870, no location of placer claim can be made to exceed 160 acres, whatever may be the number of locators associated together, or whatever the local regulations of the district may allow; and that from and after May 10th, 1872, no location made by an individual can exceed 20 acres, and no location made by an association of individuals, can exceed 160 acres, which location cannot be made by a less number than eight bona fide locators; but whether as much as 20 acres can be located by an individual, or 160 acres by an association, depends entirely upon the mining regulations in force in the respective districts at the date of the location; it being held that such mining regulations are in no way enlarged by the statutes, but remain intact and in full force with regard to the size of locations, in so far as they do not permit locations in excess of the limits fixed by Congress, but that when such regulations permit locations in excess of the maximum fixed by Congress, they are restricted accordingly. A local regulation is valid, therefore, which provides that a placer claim, for instance, shall not exceed 100 feet square. Congress requires no annual expenditures on placer claims, leaving them subject to the local laws, rules, regulations and customs.

THAT once famous district, Meadow Lake, is coming into importance again. There are few miners thereabout who were the original locators, and their faith is still strong. The Pittsburgh and Excelsior mines are the only ones giving promise of pay at this time, and they are worked by 10 men.

## Working Dry Placers.

Some months ago we gave a description of a machine for working dry placer mines, invented by Geo. Ginn, at work at the Jicarilla placer mines in New Mexico. Later still we described the dry placer amalgamator of Duhem & Bennett, which was being worked at South Park, Colorado. We have had a great many inquiries from miners in California, Nevada and Arizona, about these machines, which shows that considerable interest is manifested in them. There are large tracts of land which would pay handsomely if either of the machines does as well as is claimed; and if the inventors would give us some definite statement about the cost of the machines and who the agents are, a number might be disposed of here.

The Ginn machine is about six feet long, six feet high and two feet wide, consisting of three screens and three tables, suspended from the beams which unite the four posts which form the corner braces. The screens, or sieves, whose meshes vary in degrees of fineness, are placed directly and obliquely above each other in the upper half of the machine, while immediately beneath are placed the rawhide tables, each of which has a series of riffles, on which the gold and iron-sand lodge. The sand, gravel and clay which carries the gold is fed on the upper and coarsest screen, and passes thence to the second and third screens in succession, and, while falling from the last mentioned, the auriferous earth encounters a blast of air from a No. 2 Sturtevant blower, run at a speed of 800 revolutions per minute. This blows out the sand and permits the iron-sand and gold to settle on the riffles, from whence it is taken out and washed. This machine, the result of numerous experiments, was founded upon the fact that a body is acted upon by air in proportion to the surface it presents, and the additional fact that gold—being from 8 to 20 times as heavy as the gangue in which it is found—will fall against the riffles, while the lighter material will be blown away. In fine, it is resolved into a question of specific gravity.

This appliance has been thoroughly tried at the Jicarilla placers, and we were informed some time since by a correspondent that he had seen \$8.50 in gold taken from it after a run of 16 minutes from dirt which washed 10 cents to the pan. It is stated that the machine will handle from 30 to 40 cubic feet of dirt in a day of 10 hours. It is claimed that the machine works satisfactorily in every respect. The inventor is George Ginn, now at the Jicarilla placers. Among those who have seen it work and who may be applied to concerning it, are Hon. H. M. Atkinson, Surveyor-General of New Mexico; Capt. Purington, 15th U. S. Infantry, Fort Stanton, and Mr. Markley, editor *Trinidad Chronicle and Enterprise*, Colorado.

The Duhem and Bennett machine is now at work on a mine in the South Park, about 10 miles from Hamilton, Colorado. In this mine are all kinds of dirt, from black bottom clay and mud to the ordinary gravel deposit. The gold is very fine. The machine, which is portable, being mounted on wheels, weighs about 4,000 pounds, exclusive of an eight-horse power engine and boiler required to run it. The necessary expense of running it is from \$8 to \$12 per day. The machine was run for six days on all kinds of dirt at the trial, and it was found capable of working from 1,000 to 1,400 pans of dirt per hour.

The following paragraph from the *Denver (Colorado) Times*, of last week, refers to the same machine:

"Duhem & Bennett's dry placer amalgamator is still proving its complete success in the South Park. Last week's hrick is stamped \$107. The mine upon which the machine is operating pays but 20 cents to the cubic yard. The machine works from 80 to 100 cubic yards per day, by measurement, at a necessary cost of \$8 per day. This is the first machine actually put in operation. Improvements have been developed which will be incorporated in future machines. When it is taken into consideration that the 40 inches of water required for a small sluice head, which will carry from 30 to 40 cubic yards of dirt per day, is, with economy, an ample supply for 20 of these machines, with an aggregate capacity of 2,000 cubic yards per day; that the sluice seldom saves more than two-thirds, and often not even one-third, of the gold, while it is admitted that at least practically the machine saves all the gold, and that it handles the dirt at less than half the cost of handling the same by sluice, it must be confessed that a great advance has been made in this class of mining. The machine has passed the experimental stage and become an admitted and fixed fact. This at once imparts a value to thousands of acres in Colorado of rich (dry) placer ground, hitherto considered worthless, which will now, besides yielding handsome revenues to their owners, furnish employment to thousands of otherwise idle men."

A NEW DISCOVERY.—A gold-bearing quartz ledge has been discovered near Dutch Hill mining camp, Plumas county. Lode runs nearly north and south on east slope of Grizzly hill, Ohio creek, not far above the old placer diggings, which prospects well in free gold. Ledge is traced for 6,000 feet; William Savercoole is the fortunate discoverer.

The Nanaimo river gold diggings have proved a failure.

## Foundry Notes.

## The Pacific Iron Works.

At the Pacific Iron Works they have just completed sugar mill machinery for two plants at Honolulu, consisting of engines and boilers, vacuum pans, sugar rolls, etc. They have also recently shipped a five-stamp mill to a mine near Hornitos, Mariposa county. Are now fitting out a new surface condenser with pumps, circulating pipes, etc., for the steam-tug *Pilot*. The works are now reconstructing the 20-stamp mill of the Star company, at Cherry creek, and adding two Howell furnaces; a set of power drills, with compressor, have also been sent to this company. Two of the Howell furnaces have lately been put on at the Grand Prize mine, and are said to be chloridizing up to 91 and 92 per cent. They have just shipped a copper smelting furnace for a mine belonging to Capt. W. H. Raymond, in eastern Nevada, and are making a new water jacket smelting furnace for the Modoc mining company, Inyo county. A saw mill has recently been sent down to the Peacock mountains, Mojave county, Arizona, to get out lumber for the Harkberry mill. This mill is now in rapid course of construction, and a Howell furnace is being built for use in connection with it. At these works they are also making the boilers and machinery for one of the Newton hydraulic dredging and mining machines. The hull is under contract, and work is being vigorously pushed on the rest of the dredge.

## The Fulton Foundry

Has just completed the new machinery for the Clay street hill railroad, which is now being put up. They have on hand now a 22 by 26 engine for the Navarro river mill of H. B. Tichenor. They are also building a five-stamp mill, with pans, settlers, shafting and fittings, which are for a mine in Mexico. Are making a seven-foot vacuum pan, condenser, vacuum pumps, etc., for a sugar plantation in the Sandwich islands. New hoisting works, of a heavy character, are also being fitted up for the Tybo Consolidated mine, in Nevada. This foundry has considerable small work on hand, and is employing now some 90 men. They have just added one of Ferris & Miles' new planers, with all the late improvements, and of a large size.

## The Wilcox Pump Works

Have a large number of orders on hand, and are very busy. The capacity of the works are being enlarged by the addition of new machinery, which is now being put in. They are, among other things, building three 15½-inch cylinder vacuum pumps, on original plans, for a Sandwich island sugar plant. Pumps are being made also for the Hinkle elevator in the Nevada block, and for a deep well in the same building. A large deep-well pump is also being made for Governor Stanford's place at Menlo Park; a deep mining pump for the San Andreas mine; a brass pump for Whittier, Fuller & Co's paint works, etc. The shop is running to its full capacity, as it has been for some time.

THE Hon. H. Hussey Vivian, M. P., of the well known mining firm of Vivian & Sons, Swansea, has been in San Francisco for the past two weeks. The large copper smelting works, nickel works, zinc works, alkali works and the very extensive gold and silver works, all of which are located in Swansea, together with many miles of coal veins, are under the management of this remarkably successful firm. During the 25 years which he has served Glamorganshire in Parliament, Mr. Vivian has placed his name among the most conspicuous statesmen of his country, while as a scientist he holds an honorable rank. Mr. Vivian was last week presented by the Welsh citizens of San Francisco with a cane characteristic of the State. The staff was made of California iron-wood, with California gold for the head, inlaid with beautiful pieces of quartz from our California canyons; while the crowning beauty of the gift is a cavity in the heaviest portion of the head, similar to a locket, in which are inserted small specimens of various California minerals—such as gold, silver, copper, cinnabar, iron ores, etc.

HYDRAULIC MINING.—The article on this subject from the pen of the well-known engineer, Aug. J. Bowie, Jr., which is now being published in the PRESS, is an especially valuable one, and our hydraulic mining friends will find it alone worth more than a year's subscription to the PRESS. The facts and figures given by Mr. Bowie are of great value as showing the results of practical work. A reliable article of this kind is more profitable for miners to read and study than any other class of literature. We advise those who do not usually file away the PRESS to commence keeping their numbers now and they will have this standard article as a whole. It has been carefully revised and corrected by Mr. Bowie and comprises the whole literature of hydraulic mining in California.

A VERY rich lead of ruby silver has been opened at Rock creek, 12 miles distant from Tuscarora, and will probably rise into prominence next spring.

At Mud springs, 40 miles from Battle Mountain, ledges have been found with brilliant indications.



## HYDRAULIC MINING IN CALIFORNIA.\*

No. 2.

(By ARD. J. BOWIE, JR., A. B., Mining Engineer.)

## Investigation of the Comparative Values of the Different Gravel Strata at North Bloomfield.

With their experience of the past and considering the contingencies of proposed explorations, and the attendant costs of an enterprise which had for its ultimate aim the working of the entire auriferous deposit, after mature deliberation it was (as a preliminary step) deemed of paramount necessity to ascertain, as far as practicable, the relative values of the different strata of the gold-bearing alluvia, so that they might judge to what extent the prospects would justify their expenditures. A series of explorations were subsequently carried out under the immediate supervision of their able engineer, Mr. Hamilton Smith, Jr., and the result of his investigation is best given in his own words: "To test the comparative values of ground developed by the shaft workings and top gravel, 240 samples, weighing in all two and one-half tons, were taken at even distances from the sides of the drifts, and the same quantity sampled from different layers of the upper bank. These samples were carefully panned out, and yielded, the blue \$1.10 per ton, the white a large number of colors, but an inconsiderable weight of gold. The gold from the blue dirt was from 50 to 100 times heavier than that from the white gravel."† Although the gross yield from this sampling of the upper gravel was slight, it is a noteworthy fact that in each of the 240 pans one or more colors of gold were found.

## Comparative Value of Gravel Strata in Stanislaus County.

At the Light claim, Patrickville, a comparative test of top and bottom gravel was made. 55,340 cubic yards top gravel yielded two cents per cubic yard. The bottom gravel (four feet deep) was then washed up, when it was discovered that this ground had been extensively drifted; but notwithstanding this fact, 4,966 cubic yards yielded 55 cents per cubic yard. A trial of top dirt was also made at the Light claim, La Grange; 41,038 cubic yards top dirt yielded three cents per cubic yard, and 7,242 cubic yards of bottom dirt\*\* yielded 94 cents per cubic yard.

## Sand Strata.

In the gold-bearing drift of the Sierra Nevada, layers consisting exclusively of wash sand are generally found to contain very little if any of the precious metal††. In gulch mining it sometimes happens that from the position of the bedrock the detrital accumulations assume the form of reclining cones, the apex reposing upon the top of the hill. Where such is the case, the bulk of the gold is concentrated in the lower end of the deposit. These gulches are frequently found to be exceedingly rich.

It is not within the scope of this paper to discuss the origin of auriferous detritus, or in any way to account for the mode of occurrence of gold, but these general facts are merely cited as an explanatory outline of the subject, and to show the reason why a system of sluicing is adopted which bottoms the entire deposit.

## The Records of Gold Washing.

The early record of gold washing extends to the days of the Greeks and Romans. History has familiarized us with the wonders of the Pactolus and Tagus, and it is a fact that the diggings north of Aquitania produced in two months such a large amount of gold that its price fell 33% throughout the whole of Italy.

Gradually, one after the other, the well-known deposits of the Old World have been exhausted. The alluvia in Siberia, however, kept alive the interest in gold washing, and the subsequent discoveries in California and Australia infused a new life into this kind of mining. Since that time gold washing has been carried on in different parts of the world on a most extensive scale, but the application of water under great pressure to "gold placer mining" is an outgrowth of the present century.

Its use is chiefly confined to the Pacific coast, and consequently the contributions to mining literature relative to its application have not been numerous.

## Hydraulic Mining.

It was left to the untiring ingenuity of the California miner in his battles for fortune to devise the economical methods of hydraulic mining, by which mountains of auriferous gravel are removed through the agency of a continuous stream of water, extracting the precious metals stored away by nature, and adding millions of hidden wealth to the treasures of the world.

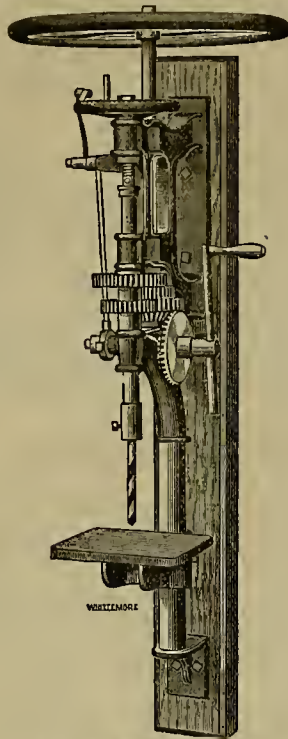
Independent of the financial importance of this most modern method of mining, its effects, from the gigantic scale with which it is now carried on, upon the system of drainage of the

country as well as the navigation of rivers, will, sooner or later, bring it in direct conflict with agricultural and commercial interests.

Apart from the construction of ditches and tunnels necessary for the hydraulic washing of the gold-bearing drift, engineers, as a rule, have had but little to do with the subsequent working of this class of mines. The primitive placer mining of 1833 to 1865 has passed into history. Forty-inch wrought-iron pipes have been substituted for canvas hose and stove-pipes, and with the replacing of one-inch streams by nine-inch diameter nozzles, discharging under 400 feet pressure, the last remnant of the Argonauts' method disappeared, and hydraulic mining, with one gigantic stride, has become an operation of such magnitude as to require the aid of science.

## The Definition of Hydraulic Mining.

Hydraulic mining may be defined as the art of extracting gold from gold-bearing detritus, *i. e.*, surface deposits, placers or washings, by means of water under great pressure discharged through pipes against the auriferous material. In working these gold deposits by this method, it is essential to success that there should be: first, economical management; second, ample facilities for grade and dump; third, a sufficient head and an abundant supply of cheap water. As regards the "economical management," the same can be considered a *sine qua non* for success in all enterprises, but it is especially requisite here, as the value of this kind of mining is based on the great facility with



The Worcester Self-Feeding Drill.

which profitable results can be readily obtained, at trifling cost from washing vast areas of ground which contain relatively, per cubic yard, insignificant amounts of precious metal, but in the aggregate, when expeditiously and skillfully worked, give large remunerative returns.

## The Dump.

Without the dump, hydraulic mining is an impossibility. On this point too much stress cannot be placed. Where thousands of cubic yards of alluvium are being daily washed from their original positions into cauyons, valleys, streams, or rivers, it is not the accumulations of a few months which must be considered, but places must be provided at lower elevations, where the immense hills of gravel, when "hydraulicked,"†† can be re-deposited; and in general a very much larger superficial area for this is requisite than was originally occupied by the material removed.

It sometimes happens in claims near or adjoining one another, working with the same dump and on a light grade, that the bedrock in one is lower than that of the other. Where this occurs the claim with the highest bedrock should be the last run off, so as not to interfere with the dump of the lower claim. An illustration of this condition of affairs is afforded by the Patrickville hydraulic claims, in Stanislaus county, where three claims, one tailing over the other, are annually worked. During the last two years the lowest claim, called the Chesnau, has been closed in the fall, its dump giving out, whilst the upper ones continued work. With the return of spring freshets, the canyon has been cleared of the debris, and washing has been regularly resumed in the Chesnau, continuing as long as the dump lasted. The upper claim is closed whilst the Chesnau is working, to avoid the too rapid filling up of the creek. If the two higher claims were worked at the same time, the Chesnau would soon be closed for an indefinite period.

† The name is generally applied to those pioneers who arrived here in 1849-50.

†† The words "hydraulicked" and "hydraulicking" are the colloquial of the California placer miner, and custom has here sanctioned their use.

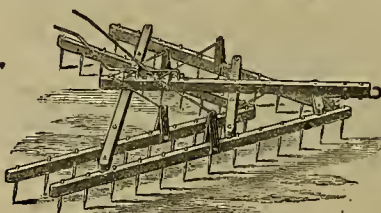
## Tailing into Streams.

It is supposed by many that the want of dump is remedied by discharging into a current or mountain rapid. This undoubtedly would be so, were the gold placers to border on large, rapid, and well confined streams; but in the mountains where the gold-bearing deposits are found, the rivers are narrow and shallow, only running water in quantity during the winter and early spring.

Some of the annoyances and difficulties arising from tailing into a stream can be seen on the Tuolumne river below La Grange. The river for 17 miles above the town has a fall approximating 15 feet to the mile. It is a large mountain stream (fed by the snows and rains of the Sierra Nevada), well confined by abrupt banks. At La Grange its width is 525 feet. Three hundred yards below the town, opposite the Light claim, it widens to 750 feet. Down the stream from this point the hills for the succeeding three or four miles recede, but subsequently form prominent banks of the river. During high water in the winter, opposite the Light claim at its greatest width, its average depth was ten feet, the center of the channel being 14 feet deep. When the La Grange hydraulic mining company commenced work, in 1872, the bottom of the channel was a few feet deeper.

The Light claim was worked in 1873, and by June 23d, 1874, 720,086 cubic yards of gravel had been discharged into the stream near the claim, and during the same period 975,064 cubic yards were dumped into the river from the Kelly and French hill properties. The results at the expiration of 21 months were that the channel opposite the Light claim was filled up, the sluices were run out of grade, the river bed was shoaled on all sides, the water of a former rapid stream straggled over the accumulated debris with a barely perceptible motion, and it is hardly necessary to add that the claim was closed.

The spring freshets of 1875-76 were unusually severe, clearing the river at the claim for its entire width, and leaving a dump of over 11 feet along its west bank. This spring (1876) work was resumed, and since then 48,280 cubic yards have been moved in the Light, and



Green's Improved Harrow.

212,346 cubic yards from French hill, which is a quarter of a mile up stream. At present\*\* the river is filled up nearly its entire width to the height of the sluices, and the water is confined to a strip 30 feet wide discharging one foot deep over a bar.

Where a small amount of tailings is discharged into narrow and steep canyons, winter rains and spring freshets suffice to clean them out, but where the quantity is large, in spite of the water the ravines gradually fill up, and hydraulic mining in those localities ultimately ceases. It occasionally happens that the want of dump room is obviated by a tunnel, and by means of it the tailings are conveyed into large and precipitous ravines, consigning them to the action of time and water for their further removal.

**Errata.**—Last issue, page 233, first column, second paragraph, fourth line, for "western boundary" read eastern boundary, also same page, fourth column, fourth paragraph, second line for "Mandango," read Mandanga.

\* The river opposite the old French Hill dump is 500 feet wide.

† At the ferry. The grade of the river from here to its mouth is only a few feet to the mile.

‡ Extreme width during high water. Width at lower stage 700 feet.

§ Deeper in narrow places.

|| April 10th work was resumed on top dirt.

\*\* Dry season—months of August, September and October.

**EUCALYPTUS FIRE-PROOF.**—At the last meeting of the Academy of Sciences Dr. Baer invited the attention of the Academy to a eucalyptus tree standing in the grounds of the old German hospital, on Brannan street. The tree had passed through the fire of August, 1876, and exhibited the peculiarity of resisting the action of fire—a property well understood in Australia. Dr. Kellogg stated that eucalyptus shingles were in common use in Australia, on account of their being fire-proof. It was impossible to fire a roof made of this material. There were some 132 species of eucalypti, but all seemed to possess this non-combustible property to some extent. Dr. Gibbon said that the planting of trees in the public streets would be an important means of checking a conflagration, and as the eucalyptus seemed to be peculiarly valuable for that purpose, and for building, the attention of the public should be called to it.

**THE CONTINENTAL ORE AND TRANSPORTATION COMPANY** have established depots at Ogden and other points of the Union Pacific and Central Pacific railroads, and they have selected Reno as the point of supply of Nevada with coal and turpentine.

## An Improved Harrow.

James B. Greene, of Elliott, San Joaquin county, has patented, through the MINING AND SCIENTIFIC PRESS Patent Agency, an improved harrow, an engraving of which is shown on this page. The improvement consists in so constructing an A-shaped harrow that the bars or timbers to which the teeth are secured are hinged to a supplemental frame, and by means of connecting rods and levers, any one or more of these sets of teeth may be turned alternately so as to relieve themselves of the rubbish which may accumulate before them and thoroughly clean themselves. The number of sets of teeth may be multiplied or increased at will, and two or more sets may be united and operated by the same lever.

When working ordinarily the levers will be retained by a central catch in a curved rack, but when the harrow becomes clogged the lever controlling the front pair of harrows is released and turned to one side.

The movement causes the hinged timber upon the side to turn, so that the teeth point backward and this allows them to be wiped clean of the rubbish. Meantime, the movement of the lever around its fulcrum will point the opposite set of teeth a little forward, and they will continue to work until the lever is turned to the opposite side, when the relative positions of these two sets of teeth will be reversed and the opposite set will be cleaned. While this is being done the rear pair of harrows are still at work, so that there will be no portion of the ground not harrowed, and they will also serve to keep the harrow level and prevent it from pitching forward with the timbers upon the ground. After the front set are cleaned, the lever is set straight and the rear lever is operated so that the rear pair of harrows will undergo the same operation and become cleaned. A pair of wheels may be attached to the rear of the harrow and support a seat.

## The Mines and the Suto Tunnel.

A meeting of the superintendents of the Comstock mines was held in Virginia City on Tuesday. There were present: E. A. Schultz of the Bullion, Exchequer and Justice; Judge Strother, of the Baltimore and American Flat; Chas. Foreman, of the Overman and Caledonia; N. C. Hall, of the Silver Hill; Mr. Perkins, of the Dayton; Hank Smith of the Belcher; Capt. Taylor, of the Yellow Jacket; Lon. Hamilton, of the Imperial and Alpha; Cal. Derby, of the Alta; J. L. Requa, of the Chollar; P. Deidesheimer, of the Hale & Norcross; Cal. Gillette, of the Savage; Col. Osbiston, of the Gould & Curry and Best & Belcher; W. H. Patten, of the Con. Virginia and California; Capt. Hardy, of the Ophir, Mexican and Union Consolidated; Chas. Bonnemont, of the Sierra Nevada; Jno. W. Mackay and Frank Thayer, of the Julia. The meeting was called to order by Mr. Requa, at half-past two. The necessity of action of some sort, with regard to the Suto tunnel, was admitted by all, and a committee was appointed to examine into the question in its various bearings, including the cost of the tunnel, the benefit it is likely to be to the mines, the cost of pumping water to the surface from the tunnel level, etc. The Committee is to report as soon as possible. The Committee is composed of Messrs. Schultz, Requa, Foreman, Patten and Taylor. John Mackay was called upon by the Associated Press reporter after the meeting. He said the Committee would labor both in Virginia and in San Francisco, and thought they would make their report in two or three weeks.

Mr. Suto says his tunnel will have cost \$5,000,000 by the time it shall have reached the Comstock, and he wants the mining companies to pay him interest upon that amount. The opposite party, however, claim that the cost was not over \$2,000,000, and do not favor Suto's proposition. This Committee is to ascertain the exact cost of pumping or draining the water from the various mines of the Comstock from the level of the Suto tunnel to the surface, a distance of 1,650 feet, or thereabouts, also the cost of pumping up the level of the tunnel, and, in short, ascertain just what the companies can afford to pay for the privilege of allowing the water to flow out through the tunnel.

## The Worcester Drill.

We give herewith an engraving of the Worcester upright self-feeding drill, of which several styles are kept in stock by Dunham, Carigan & Co., of this city. The No. 3 upright drill shown is arranged with slip gear, by which a quick or slow motion may be given the drill, for light or heavy work. In the late patterns of this size on the same shaft as the crank are light and loose pulleys, so that the drill is available for either steam or hand power. The handle may be removed by releasing a set-screw. The drill is arranged so that Morse's twist drills may be used without having to buy a chuck for them, as all sizes of these drills are made to fit. A drill of this size, in this city, has been made to drill even as large as inch and a half holes, but they are intended for smaller work.

\* A paper read before the American Institute of Mining Engineers of the Wilkes-Barre meeting, May, 1877.

† The North Bloomfield Gravel Mining Co. Report by H. Smith, Jr., pp. 17-18.

‡ \$1,200.

§ \$22,775.07, ground two-thirds drifted out.

|| \$1,500.

\*\* \$4,709.72.

†† From Whisky Run to Coquille river, Oregon, the beach sands, formerly very rich, have been extensively worked for three or four miles along the sea-coast. The productive stratum was a layer of black sand, one to two feet thick, buried from two to five feet below lighter sands. The gold occurs in minute particles. This sand likewise contained some platinum and iridosmine.—Ext. Trans. Cal. Acad. Sciences, W. A. Goodyear, of the State Geol. Survey, § Strabo, book iv., chap. vi., sec. 12. Foot-note Siberia, p. 449.



## The Wheat Fields of the World.

It will, no doubt, be of considerable interest to all to take a look upon the wheat fields of the world and gain the facts of the growing season lately closed. Our source for such information is naturally English, because as the grain is thither hound for a market, reports center there also. We find in the writings of H. Kains Jackson, in the London papers of the week ending September 17th, a general survey of the wheat harvests of the leading producing countries, and therefrom we cull notes of interest.

As regards the home crop in England, it is proving even worse than former advices have indicated. Mr. Jackson concludes that it is 20% deficient for the United Kingdom and furnishes only 10-23ds of the total required by the nation for consumption. This shows the opportunity for foreign grain. Now what is available for supplies?

Egypt is known to have had a good crop, the Vienna estimate giving a wheat surplus of nearly 2,000,000 qrs. from a yield of 25% above an average. In support of this view the export has been large, yet only on a scale that promises a total supply of 1,250,000 qrs.

Spain, from the southern climates of its coasts and plains and the elevation of its central plateau, where much wheat is planted, has a long irregular harvest period, and violent storms and floods since May have greatly reduced the promise of the earliest harvest gatherings, which were exceedingly good. However, of wheat and flour, Spain may well export 500,000 qrs., much of which will probably be taken by Mediterranean ports.

Italy, Sicily, etc., are reported at Vienna to have an average crop of wheat and barley, but cannot be considered a surplus-producing country, and is likely therefore merely to exchange by import as much as may be exported.

California and Oregon have been very unequally favored this year, the first State having a deficient, the latter a full crop, and together are expected to supply the United Kingdom with 1,500,000 qrs. of wheat. Want of rainfall is the cause of failure in California, the breadth under cultivation being still increasing.

The United States acknowledge a full crop in their earlier Southern States, and a large yield in the great wheat-producing States of Minnesota, Iowa, Wisconsin and Kansas, whilst Ohio, Indiana, Kentucky and Tennessee and Michigan have extra crops. As a result there should be an export power of 8,000,000 qrs. to 9,000,000 qrs. of wheat and flour, out of which the Continental and other buyers may take 2,000,000 qrs. from the United Kingdom.

Russia (north and south) is reported to have generally a large crop—an average in the north, an excess in the center and southern governments, and a deficiency of 13% in Poland. Many important districts acknowledge the yield to be more than double that of 1876. The capabilities of export cannot, on account of the war, be weighed with any certainty. The proportion usually coming via southern ports is extreme—15,775,000 cwt. in 1872 coming against 2,080,000 cwt. from northern ports. In most recent years the difference would be as four to one. With a harvest power of exporting 5,000,000 qrs. that power will probably be crippled for the next six months by half the quantity, and, as a result, America will rule the British market, restricted only by the interests of her own competitive sellers.

Germany is believed to have a moderate harvest, 5% short in Prussia, above an average in Saxony, Bavaria (South, Upper and Lower), 15% short in Baden, 5% in Wurtemberg, an average in Mecklenburg. Able to ship 1,250,000 qrs. of wheat in good seasons, that quantity may be expected in 1877-78 from German sources, and possibly another 500,000 qrs. from other sources that will be forwarded via German ports.

Austria and Hungary, with fair reason exult over good crops; wheat 12, rye 5, and oats 2% over an average, and barley an average yield. The weight of grain is very satisfactory in Hungary. The Vienna estimates promise a surplus for export of about 1,750,000 qrs.; but, judging from the small receipts of many previous years, the United Kingdom is not likely to draw 1,000,000 qrs. of wheat from Austro-Hungary.

France, wanting for consumption and seed about 95,000,000 hectoliters of wheat, is estimated to have grown but some 85,000,000, and to have no reserve. Allowing that France has sufficient wheat for actual consumption, the country is yet likely to import for reserve, and in exchange for flour, fully 3,000,000 qrs. of wheat, and cannot be regarded as a source of British supply.

British North America has fine grain crops, and is believed able to export 1,000,000 qrs. of excellent wheat.

Of the other countries in whose harvest we are interested, Chile and Australia, the crops promise to be good and early, harvest being expected to begin in November in the southern hemisphere. East India has been and is still a source of liberal supply for the last two seasons. A good crop was grown this year, and has been shipped freely. For the moment the calamitous famine at Madras is diverting trade; but changes from scarcity to plenty are quick in Hindostan, and the United Kingdom may certainly rely on fully last year's wheat supply coming from India.

In respect to price Mr. Jackson says: As hidden by Mr. Caird, I am "thankful they are no higher" for the household loaf. Evidently there is little chance of wheat dragging the market before the coming of another crop.

## Changing Shift.

### Novel Scene at the C. & C. Shaft.

To see the miners who delve in the steaming lower levels of our mines changing shifts is a sight quite novel to persons of the upper world, as it is to be witnessed at almost any of our principal mining works, but is particularly so at the C. & C. shaft, now that the new changing room has come into full use.

As the men are popped up on the cages from the sweltering regions below in their underground attire we see them rush away and hastily descend a stairway leading to the floor below. We follow them and a short distance from the foot of the stairs enter with them a large room from which comes a blast of heat and steam.

At the first glance we are reminded of the steerage of some large ocean steamer. The room has the same close smell, and many racks for clothing not a little resemble the crowded berths found on an ocean steamer. The rows of these racks are so close together that one can see but a few feet into the room.

Down the alleys, between the lines of clothing rush the miners toward the further end of the room, where there is a sound of splashing and falling water. Moving in the same direction we come upon an open space of some feet square, in the center of the room, in which we find a huge stove. This stove is made of a large steam drum, into which grates have been fitted, and in which a rousing fire is burning, making the place much too hot for outsiders, but apparently quite comfortable for the miners, just out of hotter regions below.

Passing to the end of the room where the splashing of water is heard, we find a crowd of men in all stages of preparation for leaving the mine. In one corner of the room, partitioned off by a screen some six feet in height, are the shower baths. There is both warm and cold water, and under the showers the men wash themselves before putting on their outdoor clothing. They perform their ablutions very rapidly, and also get into and out of their clothing with a celerity that shows much practice on the double-quick at that business.

The moment a man is dressed in his surface suit he picks up his underground rig and goes to a long and large washing trough, containing warm water. In this trough he speedily washes the woolen shirt and pants he has worn during the eight hours he was at work below, wrings them out and hangs them on his own particular hook, then takes his heavy mining shoes in hand. He plunges these into the trough, washes them both inside and out, and then places them on a shelf over the book on which hang his hat, shirt and pantaloons, when he makes a break for home.

Thus it will be seen that the miners, on coming out of the mine, wash everything they wore in the lower levels, except their hats, and even these it is probably necessary to wash occasionally.

As the principal object in washing their clothing is to get rid of the perspiration it contains, it is very quickly performed. A shirt is merely drawn rapidly back and forth a few times through the hot water, when it is wrung out, and the same with pantaloons. Any clay that may be sticking to the clothes is as speedily washed away as is the perspiration.

Owing to the great heat of the room the clothing thus washed soon dries and is ready for the miner when it is his turn to again go below. He then dons his mining rig and leaves his surface clothing on his hook. In this room some 500 miners change. There are in all 1,300 hooks. Counting each man's suit at \$10, the room would be found to contain clothing to the value of \$5,000, and enough in quantity to fill a very large second-hand clothing store. Valuables of all kinds are often left in the pockets of the clothes, but we never hear of any of these being lost.

Although to an outsider the room seems close and steamy, there is nothing like an offensive smell to be perceived. The hooks are not numbered—indeed, they are so close together that there is no room for numbering—yet every man appears to know just where to find his rig.

Yesterday being pay-day, the men made their changes with a rush; with a rush they went to the time-keeper for their checks, and, receiving these, started up the hill, like men running a foot race, for the principal office at the Con. Virginia works, to get their money. Thus there was to be seen a string of men running as if for their lives, each with his check fluttering in one hand and his dinner pail swinging in the other. This scattering line of racers extended from the C. & C. shaft some 2,000 feet up the hill, to the Cou. Virginia office.

At the office named they formed a long line, as is often seen at postoffices, each man getting his money in his proper turn, and it was in order to get in this line as speedily as possible that the men were seen to make such fast time up the hill from the C. & C. shaft.

It was a bad day for the children and others waiting to get lunches from the dinner pails of the men. In vain the youngsters shouted and held out their hands; the miners darted past them like quarter horses. They had no time to stop to fill aprons, baskets or hats, when they thought of the long line of men dragging their slow length along up at the main office, and of the bright double eagles that were being chinked into horny palms.—Enterprise.

## Heat in the Silver Mines.

Those who have never personally inspected the lower levels of our mines may obtain some idea of the degree of heat to be found therein by visiting the Savage works at the change of shifts. The men—packed together as close as they can stand on the cage—are popped up out of the shaft all steaming hot, for all the world like a bunch of asparagus just lifted from the pot. They make their appearance in a cloud of steam that pours up continuously from the "depths profound," and are dimly seen until they step forth upon the floor of the works. As the men land and separate, each carries with him for half a minute his little private cloud of vapor. As this passes off the man is seen to be naked from the waist up, his skin as wet as though he had just been lifted out of a pool of water. The men bring up with them—besides the steam—an amount of heat that may be felt by the spectator as they pass.

All this is at the top of the shaft, where it is considered quite cool—what, then, must it be hundreds of feet below, where the men started from—down where the water stands at 157° Fahr.? Down there no steam is seen—it is too hot for it. It is only when the hot, moist air coming up from the lower regions strikes the cool air towards the top of the shaft that it takes the form of steam. Down where the men come from you must keep your hands off the pump column and the pipes, and if you pick up any iron tool you will at once put it down without being told to do so. Down there they handle things with gloves on, or wrap rags about the drills they are guiding and iron apparatus they are moving, and down there, too, you will learn to keep your mouth shut after you have drawn a few mouthfuls of hot air into your lungs.

Perspire? It is no name for it. You are like a sponge that is being squeezed. You are ready to believe that you have ten million pores to every square inch of surface, or as many more as any authority may mention, and that all these pores are as big as the cells of a honey-comb. You go for ice water, and it almost seems to hiss as it passes down your throat—you keep going for it, and thus, in a short time, find out what becomes of the tons and tons of ice that are daily consumed in the mines. Remain below among the miners for an hour or two, and when you are finally popped out at the top of the shaft, all red hot and steaming, among the other asparagus sprouts, you will appreciate the beauty, the light, and the coolness of the upper world.—Virginia Enterprise.

## Mineral Discoveries in Utah.

The Salt Lake Tribune says: A great deal has been said and written of the mineral wealth of Utah, but the half has not yet been told. Every day brings some new discovery to light, adding to our untold resources. Salt Lake, Tooele, Beaver, Juah and Washington counties all boast of their rich and extensive gold and silver mines, to say nothing of their inexhaustible lead and copper deposits. But it remains for Utah and San Pete counties to come to the front with their great coal fields, immense beds of shale and asphaltum.

Within the past month or two, shale beds, miles in extent, equal to the best in the world, have been discovered in these two counties, and companies are now forming to place it in the market. It is rich in gas and oil, and if a demand can be created for it abroad, it will be a great source of revenue to the Territory.

A short time ago, the ever-active prospector, while scratching around the hills of San Pete, came upon an extensive body of asphaltum, which has hitherto been an article of import in Utah. It is used extensively for roofing, paving and other purposes, and now that it has been found in such vast quantities right at our own doors, the time is not distant when the streets and sidewalks of Salt Lake can be laid with it at a cost far below that of any other paving material. The largest croppings of this material are found on the Thistle branch of Spanish Fork, 18 miles from the Utah Southern railroad and two miles from the narrow-gauge road now already graded from Spanish Fork to Pleasant valley. It is said this asphaltum, with the present facilities for shipping, can be laid down in Salt Lake for \$9 per ton, and when the narrow-gauge road is completed to the Utah Southern terminus, it can be carried with profit for \$5. It is anticipated that the narrow-gauge road will be completed early next spring.

The other late discoveries in San Pete and Utah counties are mineral pitch, alum and paraffine in large quantities.

## The California Battery Mill.

The capacity of the California battery mill is to be increased by the addition of 20 more stamps. The work of the contemplated addition is already well under way, the blacksmith shop at the end of the battery having been removed and the end of the building taken off. A large amount of the lumber therefor is on the ground, several carloads having been received yesterday, and the work of framing the timbers is being pushed right along. Col. Fair expects to have it about ready to run in 30 days.

The pan mill has always had a capacity greatly in excess of that of the battery mill, and the proposed addition will make them both about equal. Of the Consolidated Virginia ore now subjected to the 60 stamps of the battery, 350 tons per day are reduced. When the addi-

tion contemplated is completed, the capacity of the whole mill will be from 460 to 480 tons per day.

The reasons for this enlargement are numerous and weighty. The ore is run from the C. & C. shaft directly into the battery mill, thus saving costs of transportation. The pulp is carried from the battery mill to the pan mill through a flume, and by water, and again the cost for transportation is nothing. The ore is worked closely at the mill and, above all, the amount reduced is steady and the work reliable. The company have fine mills on the Carson, but in such times as these they cannot be relied on for work, on account of the want of water. The Brunswick, for instance, with its capacity of 4,000 tons per month, is not reducing now over 40 tons a week. All these considerations show the wisdom of the movement above mentioned, since the mines have ore enough in sight to warrant it and to keep the mill running indefinitely.—Enterprise.

## The Aztlan and Senator Mills.

Parties visiting these mills, yesterday, report everything progressing satisfactorily. At the Aztlan, where they only run the batteries four or five hours per day, for want of pan capacity, and occupy the remainder of the 24 hours in working up what is crushed in that short time, the batteries were silent; but the pans, two in number were busy stirring up the silvery mass and getting ready for another 1,600-pound charge for the retort, that being the weight of the charge then being retorted by Mr. Hayne, who had his retorting furnace nearly red-hot at that moment. This mill has been shipping two bars by each express of late, the two aggregating between \$3,000 and \$4,000; but since the lower north tunnel in the Peck mine has passed the working shaft and got into a superior quality of ore, they find it necessary on this occasion to run three bars instead of two. These three bars Mr. H. was getting ready to cast when the party left.

At the Senator everything was booming. The new dry-crushing mill, with the barrel process, is now in full operation, with an extensive roasting kiln for the desulphurization of the ores. The water, which had increased to an ample sufficiency during the late rains, has begun to fail in the well, and Mr. Frederick has again turned his attention to bringing water from the mine in troughs to supply the engine and settlers. This will be completed within a few days, and then there will be no more delay for want of water, as the mine makes a large quantity that the miners are anxious to get rid of. The barrels are tumbling away day and night, and have been for nearly a week. When a clean-up is made of this run it will test the capacity of the barrel process to save the gold in this refractory ore more thoroughly than has hitherto been done in Arizona. If it shall prove that this or any other process will work this ore cheaply and save even half the gold that is in the rock, the Senator is a grand success, because the supply of ore is immense, and its richness beyond question. The only drawback has been and is the rebellious character of the ore, which is full of all manner of the most stubborn mineral known to amalgamators. If bull-dog courage ever leads to success, surely S. O. Fredericks will triumph in the end, for there is no let up to him. The outlook at present is flattering, and everybody hopes and believes that he has hit upon the right process and that henceforward he will have plain sailing on the way to fortune.—Arizona Miner.

A GRIEVOUS CATTLE DISEASE IN OHIO.—A dispatch from Cleveland, Ohio, says: A terrible cattle plague has broken out in the suburbs and the country surrounding this city. The veterinary surgeons of the vicinity have carefully investigated it, and pronounce it a species of Texas fever. It originated probably by the importation of Texas cattle. This year these animals are covered with ticks of two varieties, whose bite is a deadly poison. The blood impregnated with the virus of these ticks flows to the liver, where it destroys the delicate secretory membrane, and from there to the kidneys, whence it is passed to the bladder. The disease was at first thought to be red water. Cattle are dying daily. The milk and beef are impregnated, and the animals are often so far gone before they are known to be ailing that no help remains for them. Several cases of children being poisoned in the city from partaking of the milk have already come to notice, and the people are thoroughly alarmed. The Leader will publish, to-morrow, a long statement from a surgeon who has treated more than 40 cases, and made a careful post-mortem examination of the bodies. He says that it can be cured if taken in time. His plan is to wash the animal with a lotion, which acts as a disinfectant for the ticks and an antidote for the poison. The affected beef is quite readily detected by a skilled eye. The fatty portion is brownish yellow and the lean quite red. When exposed to the air for a short period, this meat becomes putrid and of a dark brown color. The disease is very infectious. Cattle become infected by contact with the virus deposited upon the grass by diseased cattle while feeding, and by drinking from a stream which has flowed through a pasture containing diseased cattle. The plague will prove very disastrous in this dairy section if it is not immediately checked. The symptoms are a heavy falling off in milk, and bloody urine. Death follows in a few hours.



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## Testing and Working Silver Ores.

The above is the title of an illustrated work of 114 pages, for miners and prospectors, by Chas. H. Aaron, which has just been issued by Dewey & Co. Mr. Aaron has managed to give many useful hints and suggestions, free from all technicalities, and in such a style as to be easily comprehended. It is written for the miner, with no chemical symbols or metallurgical technicalities to confuse those who are not chemists or metallurgists. The following summary of the contents of the work will give an idea of its scope.

Under the heading of the first chapter, "Testing Ores for Silver," we find paragraphs on ore formation, test for silver, with heat and water, acid or blow pipe. In speaking of testing for a process, the extent and richness of ore is considered, smelting ores, selecting and working sample, appliances for testing, roasting, etc. Under the heading of "Working Ores" the author describes Aaron's process has something to say of superheated steam, preparation of dichloride of copper and protoclauride of copper, use of copper and iron, quantity of chemicals, carbonate of lime, chloride ores, amalgam, Patchen's process, etc. He also describes the methods of working roasted ores, treatment of base metals, stirring heat of furnace, want of sulphur, etc. Under the heading of "Leaching Processes" are the following: Smelting, Mexican process, Chilean process, Krichke's process, etc. Under "Pulverizing Machines" are described the arrastra and its construction and operation, stamp batteries, screens, Crocker's trip-hammer battery, Paul's pulverizing barrel, Kendall's battery, Noice's pulverizer, a cheap rock breaker, etc.

In speaking of amalgamators the author describes a cheap amalgamator, giving the core, directions for making a barrel, giving the mechanical wear, use of quicksilver, copper in bars, a cheap barrel, cheap barrel trough, barrel on rollers, Aaron's amalgamator, separator, etc.

He describes an improvised retort, roasting furnace, furnace tools and furnace building. Among the miscellaneous mention may be found Aaron's leaching apparatus, with two or three different arrangements, a small mill, sampling tallies and settling tanks, dichloride of copper, etc. Mr. Aaron is a practical miner, of long working experience on this coast.

The book is a serviceable one for miners and prospectors' use. Price, post free, \$2.00. Address Dewey & Co., MINING AND SCIENTIFIC PRESS, 202 Sansome Street, San Francisco.

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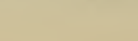
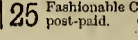
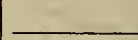
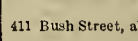
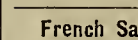
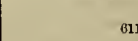
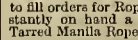
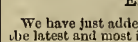
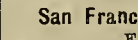
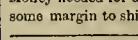
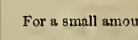
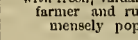
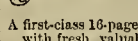
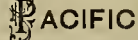
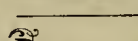
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RICHARD HOSKIN.

Dutch Flat, Sept. 17, 1877.

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(Continued from page 245.)

of good ore, and Woodruff & Co.'s Zagomanique, a 13-foot vein, a part of which samples high, and the Hidalgo, Pilate and Cubb. The Policy, owned by Garret & Dorr, has been turning out good ore and the vein is well defined. The White Pine has been paying handsomely. Waite & Co. are preparing to go to work on the Alta, a promising lode. Quite a number of other lodes are more or less developed, and have been proved to contain paying ore. Some high grade ores were recently found in the Strawberry and in the Keystone. The Mill creek mine now employs more men than any other, and is paying well with plenty of ore in sight.

At the present time Pony is considered rather dull, but the resumption of work by the Moreland mill and the starting of the Lehman mill will give a new impetus to business in a few days.

### Idaho.

POTOSI.—Owyhee *Avalanche*, Oct. 13: At the Potosi stoping is being prosecuted on an extensive scale. Both north and south the ledge is growing larger and richer as the work progresses.

At the Belle Peck the main tunnel is being run into the mountain and good progress is being made with the work. That part of the ledge which the present work aims to reach will soon, it is believed, turn out to be an immense bonanza, and this belief is shared in by those who are familiar with the formation.

EMPIRE.—Work progressing without material change of prospects at the Empire. The stopes in the vicinity of the 6th level are yielding well. Sinking towards the 5th level is progressing favorably, and the shaft will be timbered and completed about three weeks hence. A cross-cut will shortly be commenced on the lower level.

GOLDEN CHARIOT.—The work of sinking is progressing rapidly at the Golden Chariot, and everything about the mine wears an active and prosperous look.

Mr. MARTIN has discovered an immense ledge in the vicinity of the Poorman, which he has called the Ellsworth.

THERE is every prospect that the Poorman will be started up in a week or two. Mr. Baldwin and several other gentlemen are making an earnest effort to this effect in San Francisco.

GAMBRIUS DISTRICT.—Cor. *Idaho World*, Oct. 6: All is life and bustle around the new mines. The boys are working day and night in the Golden Gate. The vein is now cut into the levels for a distance of 45 feet, and still the pay continues. About 20 feet from the shaft, on the west drift, a change in the formation of the ground took place, throwing the ledge about two feet into the hanging wall. The boys were in doubt as to whether the ore would continue beyond this break, and several dismal countenances might have been seen, for a few hours only, as in a short time the back wall was encountered and the vein again found far better than before. The ore now found in the face of the drift will go at least \$250 per ton. The levels will be pushed ahead with all speed for some distance, when stoping will be commenced, the rock crushed and a clean-up made that will astonish the natives. It has been rumored that the Forest King had given completely out, but a glance at the premises to-day will convince any one to the contrary. It is true, however, that the rich lode of ore that was first struck in the cut did not continue for any distance, nevertheless it is liable to come in again just as quick as it went out. It's a poor rule that won't work both ways. The ledge is still well defined, with good clay walls. The shaft is now down about 15 feet, and one-half the rock taken from it is pay ore. The Sub Rosa needs no comment. All that is necessary to make one long to be in the place of one of the miners, is to just peep into the battery. If winter does not set in so early, they will, beyond a doubt, clean up \$75,000 this fall.

### Rickard's Oxidizing Furnace.

This furnace is constructed on a simple and inexpensive plan, which retains all the well-known advantages of the old reverberatory, combined with some novel applications of chemical and mechanical forces, which expedite its oxidizing, sulphating or chloridizing action without entailing any additional expensive machinery or special technical skill in the management.

It consists of an ordinary three-hearth reverberatory furnace, fitted with the usual fire-place, discharge holes in floors and working doors; iron pipes or brick flues are carried round the lower hearth, through the fire bridge, and terminate in a horizontal orifice, in the throat or gorge of the furnace.

Through these pipes or flues, a powerful blast of air is sent by means of a fan, or other blower, which, being raised to a red heat during its passage, strikes with considerable mechanical force a shower of pulverized ore which enters the furnace from another horizontally elongated orifice, placed two inches above this hot air blast; the supply of ore being regulated by a screw, with a conical pulley working in a hopper, which conveys it into the vertical passage terminating in an elongated ejection. The screw is worked faster or slower, according to the character of the ore being operated on, or, in other words, the quantity of sulphur, arsenic or metal which has to be oxidized or burnt off—for instance, ores containing 15% to 20% of sulphides or arsenical metal, may be introduced at the rate of a ton an hour into a medium sized furnace of say 10 by 5 feet hearths, while those carrying higher percentages of pyrites or other oxidizable matters, must be fed more slowly, till the maximum quantity shall have been determined by the operator.

The mechanical effect of the hot-air blast is to scatter the ore all over the three hearths of the furnace, previously brought to a bright red heat, but not beyond, by the ordinary firing; the heavier (larger) particles falling on the bottom, while the lighter (finer) portion is carried by the blast on to the two upper floors, and finally into the extensive dust chambers attached, where the continuous force of the blast keeps it in motion, scattering it through the atmosphere, and exposing fresh surfaces on the floors much more effectually than can be accomplished by any raking motion, either by hand or by any system of machinery, both of which involves a serious outlay, fatal in low-grade ores, while this arrangement performs the mechanical work at no cost beyond the insignificant item of power to keep the blower in

motion. The coarse ore, falling on the bottom hearth, is acted on by special hot-air jets, proceeding from the fire bridge and sides of the furnace.

Its chemical effect is produced by the introduction of the largest possible amount of oxygen, in the form of atmospheric air, at a high temperature, which, it is claimed, will not cool the furnace, uncontaminated by the products of combustion, as is the case with roasting furnaces hitherto in use. The oxygen is consequently in the best possible condition for combining with the sulphur and other matters in the ore to be oxidized; which, being by the force of the blast simultaneously spread in a finely divided state, over a large and ever-changing heated surface, is almost instantaneously attacked by the oxygen and either thrown off as a gaseous product of combustion (SO<sub>2</sub>, etc.), or retained in the furnace as a metallic oxide.

When it is considered that a ton of pyrites ore requires about its own weight of oxygen to roast or oxidize it completely, by converting the sulphur into sulphurous acid gas, and the iron into a state of peroxide; and, that a cubic foot of air contains but a quarter of an ounce of oxygen, it will readily be seen why the action of the old reverberatory furnace has been so slow and costly; incessant labor having been necessary to rake over the ore, in order to present fresh surfaces to be oxidized by the limited supply of oxygen which found its way into the furnace through the fire bars and fuel, the air having performed its duty as a supporter of combustion on the carbon and hydrogen of the fuel, had very little oxygen left available for the purpose of desulphurizing and oxidizing the ore. Hence, its abandonment in the Pacific States, where the cost of labor and fuel would only admit of its use in cases where the richest kinds of ore were being reduced.

The numerous improvements which have been made in roasting and chloridizing furnaces, within the last few years, present some very ingenious and effective mechanical arrangements for scattering the pulverized ore in the flame and doing away with the expensive hand labor of raking; but most of them involve a heavy cost in current working charges, in addition to the wear and tear of the indispensable machinery, and also fail in the essential point of furnishing the necessary oxygen in such quantities, and under such circumstances as to produce almost instantaneous oxidation, *i. e.*, perfect roasting, either by chloridizing, sulphating or other condition desired for the further treatment of the ore through the instrumentality of the all important element, oxygen.

Another very valuable and economic effect produced by this introduction of large volumes of hot air, is the complete combustion of all the fuel used, not a particle of which can escape in an uncombusted condition, as soot; the result being a maximum roasting effect with a minimum supply of fuel.

By the time the hot blast has passed through all the dust chambers and reached the chimney, it has become charged more or less with fumes of sulphurous and sulphuric acids, which, being brought into contact with steam, air and water, (aided by nitrous fumes evolved in the dust chamber) which are introduced by suitable pipes and taps, into the tower, are converted wholly into sulphuric acid (as in an ordinary vitriol chamber), which is collected in a lead vessel at the bottom of the shaft, furnished with an overflow pipe which communicates with another larger vessel of the same kind, sunk in the ground in any convenient part of the premises, from whence the acid may be pumped up from time to time, and used for washing tailings, where copper ore has been operated on by the "Hunt & Douglas" or other lixiviating process, blue-stone making or for other purposes.

It is claimed that by a careful attention to the requisite temperature and other essential conditions, copper ores may be sulphated to a higher percentage in this furnace than has hitherto been attained by any other system of roasting.

When used for chloridizing silver ores, the highest practical results are obtained with from one-third to one-half less salt than is now being consumed by the very wasteful and unnecessary custom of introducing it into the furnace with the raw ore, by which the greater portion of it is converted into sulphates of soda, lime, alumina, and other useless and valueless products before its chlorine commences to act on the silver contained in the ore. By simply mixing the actual quantity of salt necessary to accomplish the chlorination of the silver with the roasted ore on the bottom hearth of the furnace (after adding the ore from the two upper hearths for the purpose) for about a quarter of an hour before withdrawing the charge, a most perfect chloridizing effect will be produced, enabling the ore, we are told, to be worked up to 90% or 95% of its assay value.

In addition to the advantages already stated regarding its power for rapid and cheap oxidation, chloridation, etc., it can be worked at a very small expense, only two men (*viz.*, one to feed with another to fire and discharge) being required on a shift, or four to the day of 24 hours, during which time, while roasting 20 tons of ore, its consumption of wood will not exceed three cords (usually not over two and a half), in consequence of a suitable moderate temperature being steadily maintained (overheating being carefully avoided), and the complete combustion obtained by the introduction of heated air, thereby avoiding the customary loss of fuel (30% to 50%) entailed through the habitual and almost universal neglect in pro-

viding a proper combustion chamber in roasting and other furnaces.

There being no complicated or expensive machinery in connection with this furnace, its construction is of the cheapest possible kind, involving very little outlay beyond bricks and labor. A model may be seen at the office of Col. J. D. Graham, 302 Montgomery street (Room 14), San Francisco, where all further particulars can be obtained.

### Whited Sepulchers in Finance.

Of what use are exhortations to frugality and economy? Where is the encouragement for the industrious man to undergo the self denials which attend the accumulation of savings? How can society longer urge upon its members the rule of "a penny saved is two pence earned?" Of what use to glorify that method in industry which determinedly lives within an income and sets aside a part of the receipts from each day's labor, so that the laborer may triumph over hardships and unseen reverses which are the lot of all men!

Such thoughts arise each time there comes tidings of the failure of a savings bank. Far too frequently of late it has been shown that some establishments which extend the most flattering incentives to frugality and the accumulation of savings, have proved delusions, snares and traps of the most outrageous character. By their offers of large reward for savings they have awakened the provident desire, and then, by their wreck and ruin they destroy the spirit and ambition utterly. They injure society far more than can be measured by the count of the dollars of which they rob the unwary. They excite general distrust. Their legacy to society is oftentimes woe and want, and they always impart disheartening discouragement which paves the way to prodigality and recklessness. They are an insidious and unmitigated curse to a community. For the welfare of humanity it is plain that their uprising should be impossible. Foul financial fungi, they attach themselves to the word "saving," which is the keynote of a noble industrial independence, and transform it into a by-word, a symbol for deception and destruction.

How long will society tolerate such clogs to its advancement? We need not now instance the savings frauds which came to light three weeks ago in Chicago. They were enough to raise the indignant ire of honest men the world over, but we have illustrations nearer home. What a spectacle is presented to the enlightened contemplation of the nineteenth century in the events which are now transpiring in this city. What does the name Duncan now signify to the people of California? A vulture, gorging itself upon the fruits of other's industry; hiding its foul character beneath the cloak of honorable enterprise; maintaining its evil banquet until the last Saturday night's earnings were seized upon, and then disappearing under cover of a night, which was light indeed when compared with its criminal blackness.

What a reflection it is upon the wisdom of a people when it is possible that a president of a savings bank should be able to vanish after having hopelessly destroyed more than a million of the hard earned dollars of hopeful toilers. What does it mean when a financial trap is sprung in the sight of the community, and all its resources are seen to be a lot of unpaid-for furniture and gilded signs—mere bait to allure its victims to destruction? Is a people just to itself when the sacred word "Fidelity" can be made a synonym for "fraud"?

These are considerations of the widest and deepest practical importance. It would be a wholesome warning to swindlers in high places if all the scoundrels which have of late robbed a trusting people should be awarded full punishment for their crimes, and so we hope they may be. But this is a small part of the lesson which recent events should impart. The public itself has a lesson which should be learned well and quickly. The times call not alone for punishment, but for prevention. Let not the people rest with duly punishing an evil deed, but let them make such deeds impossible. This is plainly both in the interest of honest banking and honest saving. No sound and honest public institution should object to having its resources carefully examined in the public interest, so that all may know the extent of its actual resources and the character of its securities. Honest, safe, conservative financial institutions, which are the safeguards of industry and commerce, should court such investigation as the best possible advertisement to the public of their condition. Those which are dishonest, reckless, and based upon promises of doubtful value, or enterprises of unproved character, may well fear, but should not escape inspection in the public interest. We have laws concerning banking and other public institutions it is true, but of what value are they if they permit good reports both from honest men and swindlers? Nets which catch good and evil fish only become of value when good are received and the bad rejected. Evidently laws are but delusions, and reports a snare, unless there be the further ability to discover what claims are true and what are false. It is but plain justice which a people owes itself, to know beyond a doubt what institutions of trust are enduring monuments of industrial progress and security,

and what are but whited sepulchers—fair without, but filled within with the rattling bones of fraudulent securities, dishonesty and corruption. This is a question which should come before our coming Legislature, and he forced upon their most wise and careful examination by the recent remarkable disclosures. Let us have some test by which a people shall know which, of all the establishments which don the garb of trust and security, have within their vaults that which has the true ring of honesty and honest metal, and which have but gilded furniture—traps to gather personal spoils, and return a trusting public naught but spelter. This is a crowning necessity of the time. Let not the people's representatives shrink from securing it.

Until relief is furnished warning is essential. "By their fruits ye shall know them," is an injunction wise and old. Beware of that which reason does not commend. Shrink from a purchaser who offers greater values than conditions seem to warrant. Hold a tight rein upon confidence when claims of "good things" are freely bantered. Remember that the man or the institution which offers you much more than the current rate of interest for your \$100, could get a \$1,000 elsewhere for less, if his security were worthy of it. Put no fidelity in signs. Jonah was a believer in signs, and he was swallowed. Cling to that which you know is sound and true. When it is plain that the law does not protect you, be wise—protect yourself.

DO NOT GO TO GUATEMALA.—The United States Counsel at Guatemala, Mr. Williamson, has written as follows to some gentlemen in this city, who intended fitting out an expedition to prospect for mines in Central America: "In reply to your letter of August 29th, I would say that the mining region has not been carefully examined. Two Americans, who have mined in California, report that it is the hottest, sickliest and most destitute region they have ever seen. They say from their experience a miner could make fair wages there if it were not for the government regulations. The government here does not allow miners to work in the region at present, and you would, I believe, be greatly disappointed if you were to come here. The region is on the Caribbean, north coast of Guatemala, and you would have to travel by land from San Jose, on the Pacific, a distance of nearly 300 miles, to reach it."

MINING STOCK SUIT.—E. B. Dickinson has filed suit in the Twelfth District Court against C. W. Keny, the Cherry Creek Con., Steptoe and Midas, Star and Gray Eagle mining companies, John D. Coughlan and others, for an account and dissolution of a copartnership existing between plaintiff and the first-named defendant, and for an injunction restraining the defendants from disposing of any of the stock of the mining companies named belonging to the copartnership. Judge Daingerfield has issued the restraining order as prayed for, directed particularly to John D. Coughlan, the Star mining company and the Gray Eagle mining company, enjoining them from selling, hypothecating, or in any way interfering with the stock mentioned in the complaint.

TUSCARORA DISTRICT.—There are about 200 houses and cabins at Tuscarora. Building lots are worth \$100. Wood is scarce and sage-brush and coal are used for fuel. The population of the camp is about 1,500, and there are many more there now than can find employment. The cost of living is high, ordinary board and lodging costing \$15 per week, and extra accommodations range from \$4 to \$6 per day. Miners and laborers get \$4 per day, and mechanics from \$5 to \$8. The placer diggings near by are extensively worked by Chinese, and pay from \$1.50 to \$3 per day when there is plenty of water. There are two stage lines to the town, and the place boasts two newspapers. The Grand Prize is the principal mine, the next best being the Navajo, Silver Pine and Independence.

PACIFIC COAST ESTIMATES.—Among the estimates sent to Congress by the Secretary of the Treasury, are the following, recommended by the Engineer department, and transmitted by the Secretary of War and Secretary Sherman, without recommendation: For river and harbor improvement during the current fiscal year: Oakland harbor, \$200,000; Wilmington, \$100,000; Sacramento and Feather rivers, \$20,000; San Joaquin, \$35,000; lower Willamette and Columbia, \$150,000; upper Willamette, \$45,000; upper Columbia and Snake rivers, 30,000; canal at the Cascades of the Columbia, \$300,000; also the following: for fortifications at Fort Point, \$60,000; Lime Point, \$80,000; Alcatraz, \$50,000; San Diego, \$50,000; mouth of the Columbia, \$20,000.

THE work at the Kimball manufacturing company upon the cars and dummies for the California street railroad is progressing rapidly. One dummy is nearly finished, and is a novelty in that line, being entirely different from anything of the kind at present in use.

A SPECIAL from Scranton says: It is believed the striking miners will go to work this week. Four hundred Hyde Park miners resolved to leave the miner's union, and go to work on the terms offered. Troops are ready to move at a moment's notice.

FREIGHT for the new 20-stamp McCracken mill comprised some 185 tons of material, all of which has gone forward except some 20 tons still at Colorado station.



## General News Items.

A GENERAL resumption of work in the Lehigh valley collieries is expected this week.

THE strike of the New York cigar makers has become general. The number of men and women now idle is estimated at 15,000.

ST. THOMAS advices state that a fearful hurricane visited Curacao and neighboring islands on September 23d, and caused great damage.

It is estimated that the famine will cost the British-Indian government £15,000,000, exclusive of the loss of revenue and other indirect effects.

THE India government offers a prize of £5,000 for the best, and £1,000 for the second best machine or process for the preparation of ramie fiber.

ONE steamer at New Haven is ready to sail for Constantinople with 2,150 tons of ammunition, valued at \$2,000,000. Another steamer is preparing.

A WASHINGTON special says: Ex-President Grant, in a letter just received by a relative, states that he has found the labor of accepting the hospitalities of his English friends more arduous than the cares of state.

THE liabilities of Cross & Co., who failed last week are \$600,000 and the liabilities \$400,000. It is probable that a compromise will be effected on the basis of 60 cents on the dollar, and the firm allowed to resume business.

It is now proposed to widen Washington street from Montgomery to East by including in the present 50-foot roadway 40 feet from the south side of the street. Half a million dollars is the estimated expense.

ADVICES from San Domingo to October 5th state that the revolution against the Baez administration was in full force. Puerto Plata was occupied by the revolutionists, who were besieging the fort, and expected its surrender momentarily.

THE Executive Council of the Philadelphia Board of Trade have adopted a resolution declaring the tax imposed upon capital, deposits and circulation of national banks as onerous, and should be reduced, and that a memorial be presented to Congress to that effect.

OUR overland treasure shipments for the first half of the current month were unusually light, amounting to \$646,355, of which \$517,616 was in gold coin. Besides this \$793,535 was shipped to foreign ports, making a total of \$1,439,890. For the past seven months we have been shipping from \$4,500,000 to \$7,000,000 in treasure per month.

THE New York Sun says: The grain crop of the United States this autumn is a vast increase over that of any preceding year in the history of the country. It amounts in the two principal cereals—wheat and corn—to 325,000,000 bushels of the former, and 1,250,000,000 bushels of the latter, according to the carefully prepared estimate of Walker, the statistician of the New York Produce Exchange.

PRESIDENT WILLIAM H. VANDERBILT, of the New York Central; Hugh J. Jewett, of the Erie; Thomas H. Scott, of the Pennsylvania Central, and John W. Garrett, of the Baltimore and Ohio, representing the trunk lines, were in session in New York, on the night of the 15th, considering the propriety of advancing freight rates, and changing the proportion now allotted to each of the four roads in the pooling of the West-bound earnings.

DURING the month of September, 749 passengers arrived in this State by sea, and the departures numbered 1,820, principally Chinese on their return to Hongkong. The total arrivals overland and by sea were 4,162, and the departures 4,852. Twelve hundred more Chinese left the State during the month than came into it. During the nine unexpired months of the present year, our net gain of population by immigration was 16,287, which is 10,000 less than last year, and 36,700 less than in 1875, when the immigration was unprecedented. Of the 84,100 arrivals for 1875, 15,900 were credited to Japan and China, while of the 64,700 last year, 14,700 were credited to those countries. During the past nine months our arrivals from Japan and China have been only 6,700. The Chinese arrivals for the first nine months of 1875 exceeded the departures by 12,275; in 1876 by 10,446, while this year the excess is only 3,102.

THE World announces that a distinguished citizen of New York, assumes the whole expense of removing and putting up the Egyptian obelisk. The estimated cost is \$150,000.

THE San Diego News has it on authority of Mayor Pico that rich placers have again been discovered in Lower California. Mr. Pico says that the placers pay \$70 a day to the hand, and if there is room and water for work, of which the News did not learn, it is a big opening for the people of Lower California, and, no doubt, they will improve it. The placers are near San Diego, say about 50 miles out, and 25 miles from the rancho Nejo, below Los Juntas. It is highly probable that if the placers are half as rich as reported, there isn't any water to work with or there is some equally disappointing drawback. We have not much faith in Lower California mines, and have yet to find some who have made money there mining.

THE September hullion product of the Leeds mine is \$33,370, a gain over the previous month. The dividend is assured, and may be increased.

## PATENTS AND INVENTIONS.

## List of U. S. Patents Issued to Pacific Coast Inventors.

[FROM OFFICIAL REPORTS FOR THE MINING AND SCIENTIFIC PRESS, DEWEY & CO., PUBLISHERS AND U. S. AND FOREIGN PATENT AGENTS.]

By Special Dispatch from Washington, D. C.

WEEK ENDING OCTOBER 20, 1877.

EAG BEATER.—Thomas Borchert, S. F.  
DISH WASHER.—Samuel S. Watson and John J. Scott, S. F.  
AERIAL MACHINE.—John B. Ward, S. F.

The patents are not ready for delivery by the Patent Office until some 15 days after the date of issue.

NOTE.—Copies of U. S. and Foreign Patents furnished by DEWEY & CO., in the shortest time possible (by telegraph or otherwise) at the lowest rates. All patent business for Pacific coast inventors transacted with perfect security and in the shortest possible time.

THE MARIPOSA SUIT.—A dispatch from New York says: The real facts of the pending suit between Eugene Kelly and the Mariposa mining company are briefly these: Kelly proceeded to foreclose a mortgage held by him on the Mariposa mining property. T. O. Wallace, a heavy stockholder, claiming for himself and others that the mortgage was fraudulent, and that all just claims against the company have been paid, brought suit here against Kelly & Co., to compel them to surrender said mortgage upon above stated grounds, and also to recover \$300,000 claimed to be due to the company by defendants and \$1,000,000 damages which the company and stockholders claim to have suffered through illegal acts of the defendants. Judge Dykman, on motion of ex-Judge Fullerton for the plaintiff, granted a temporary injunction restraining Kelly & Co. from continuing their foreclosure suit in California and interfering with the estate or the possession thereof of the Mariposa land and mining company, by its officers. The argument upon the question of making the injunction permanent was yesterday postponed to Monday next, at the request of Kelly's attorney.

VICTORY FOR THE RAILROAD.—In the suit of the United States against the Central Pacific Railroad Company, to recover five per cent. on the net earnings of the company from July, 1869, to October, 1874, amounting to \$1,836,635 10, Judge Sawyer has rendered a decision in favor of the defendant, on the ground that the construction of the railroad had not in its completeness reached the standard at which, according to the law, percentage was chargeable. In the opinion of the court the Central Pacific Railroad Company did not become liable to apply five per cent. of the net earnings of the Central Pacific railroad annually to the payment of the subsidy bonds and interest in pursuance of the acts of Congress authorizing the construction of the said road, till October 1st, 1874, the date of the completion of the road.

THE PACIFIC BUSINESS COLLEGE.—This institution is now so well known on this coast that it is scarcely necessary to direct the attention of the public to the advantages offered by it. The facilities offered for a practical business education are unexcelled. Young men who have been trained at this college now occupy responsible positions in all the departments of business. A first-class business education is imparted together with a practical knowledge of telegraphy, and a thorough instruction in English and mathematical branches, penmanship and modern languages. The courses of study in all branches are eminently practical.

## New Incorporations.

The following companies have filed certificates of incorporation in the County Clerk's office at San Francisco:

COMMONWEALTH CON. Co.—Oct. 16th. Location: Elko county, Nevada. Capital stock, \$10,000,000. Directors—Walter M. Rockwell, Thomas Walling, Charles A. Morse, Stephen H. Phillips and Pelham W. Ames.  
UNITED STATES PETROLEUM Co.—Oct. 16th. Location: Ventura county, California. Capital stock, \$800,000. Directors—Chas. E. Convis, Edwin W. Crook, O. H. Brooks, Thos. E. Atkinson and W. B. Murdock.

BULLION SHIPMENTS.—Since our last issue shipments of bullion from prominent mines have been as follows: Northern Belle, Oct. 7th, \$13,147.06; California, 10th, \$113,899.47; Con. Virginia, 10th, \$241,384.35; Northern Belle, 9th, \$4,837.35; Arizona, 10th, \$541.70; Grand Prize, 12th, \$14,700; California, 13th, \$252,757.03; Con. Virginia, 13th, \$80,880.08; Manhattan, 9th, \$12,400; Raymond & Ely, 10th, \$15,000; Northern Belle, 11th, \$5,164.78; Arizona, 13th, \$1,276.42; Modoc, 12th, \$6,327.13; Coso Cou., 10th and 12th, \$3,550.19; Indian Queen, 8th, \$4,845.38; Manhattan, 11th, \$12,106.60.

INCOMPARABLY beautiful are Morse's retouched and colored photographs, and glaze pictures, and we are astonished that so plain a face can be made to look so well as many that we saw there, and yet retain the expression and features of the sitter. The retoucher's art softens the asperities of a rugged countenance, until we see it in its sunshine, where we were wont to look for shadow. This is the true artist's work, and nowhere is done to greater perfection than at Morse's, No. 417 Montgomery street.

## METALS.

(WHOLESALE.)

THURSDAY, M., October 18, 1877.

IRON.—		
American Pig, ton.....	23 00	@ 32 00
Scotch Pig, ton.....	32 00	@ 33 00
White Pig, ton.....	28 00	@ —
Oregon Pig, ton.....	—	@ —
Refined Bar.....	31 00	@ —
Horse shoes, keg.....	5 00	@ —
Nail Rod.....	—	@ 7 75
Norway, Oval.....	—	@ 7 75
Roller.....	—	@ —
COPPER.—		
Copper Tinned.....	37 00	@ 40
Sheathing, lb.....	37 00	@ 40
Sheathing, Yellow.....	17 00	@ 22 1/2
Sheathing, Old Yellow.....	17 00	@ —
Composition Nails.....	21 00	@ —
Composition Bolts.....	24 00	@ —
STEEL.—		
English Cast, lb.....	14 00	@ 5
Anderson & Woods, ordinary sizes.....	16 00	@ —
Drill.....	16 00	@ —
Flat Bar.....	15 00	@ 18
Pow Steel.....	8 1/2	@ 12 1/2
TIN PLATE.—		
10x14 C Charcoal.....	8 50	@ 9 00
Banca Tin.....	24 00	@ —
Australian.....	19 00	@ 20
ZINC.—		
By the Cask.....	11 00	@ —
Zinc Sheet 7x10 ft, 7 to 10, lb.....	11 00	@ —
7x10 ft, 11 to 14.....	11 00	@ —
8x10 ft, 10 to 14.....	12 00	@ —
8x10 ft, 11 to 10.....	12 00	@ —
NAILS.—		
Assorted sizes.....	3 00	@ 25
QUICKSILVER.—		
By the lb.....	47 1/2	@ 50

## LEATHER.

(WHOLESALE.)

WEDNESDAY M., October 17, 1877.

Sole Leather, heavy, lb.....	25 00	@ 25
Light.....	22 00	@ 24
Jodot, 8 Kil, doz.....	48 00	@ 50
11 to 13 Kil.....	65 00	@ 76 00
14 to 19 Kil.....	80 00	@ 90 00
Second Choice, 12 to 16 Kil.....	50 00	@ 60 00
Corinthian, 12 to 16 Kil.....	57 00	@ 67 00
Females, 12 to 16 Kil.....	63 00	@ 67 00
14 to 16 Kil.....	71 00	@ 76 50
Simon Ulmo, Females, 12 to 13 Kil.....	58 00	@ 62 00
14 to 15 Kil.....	66 00	@ 70 00
16 to 17 Kil.....	72 00	@ 74 00
Simon, 18 Kil.....	61 00	@ 63 00
20 Kil.....	65 00	@ 67 00
24 Kil.....	72 00	@ 74 00
Robert Calif, 7 and 9 Kil.....	35 00	@ 40 00
Kips, French, lb.....	1 00	@ 1 35
Cal, doz.....	40 00	@ 60 00
French Sheep, all colors, doz.....	8 00	@ 15 00
Eastern Cal for Backs, lb.....	1 00	@ 1 25
Sheep Roams for Topping, all colors, doz.....	9 00	@ 13 00
For Linings.....	5 50	@ 10 50
Cal, Russet Sheep Linings.....	1 75	@ 4 50
Boot Legs, French Cal, pair.....	4 00	@ —
Good French Cal.....	4 00	@ 4 75
Best Jodot Calif.....	5 00	@ 5 25
Leather, Harness, lb.....	35 00	@ 38
Fair Hide, doz.....	48 00	@ 50
Skirting, lb.....	33 00	@ 37
Wool, doz.....	30 00	@ 50 00
Buff, ft.....	18 00	@ 20
Wax Side.....	17 00	@ 18

## Gold, Legal Tenders, Exchange, Etc.

[Corrected Weekly by SITRO & Co.]

SAN FRANCISCO, October 17, 3 P. M.

LEOAL TENDERS IN S. F., 11 A. M., 37 1/2 @ 37 3/4. SILVER, 40 3/4 Gold in New York 103 1/2.  
GOLD BARS, 900. SILVER BARS, 92 1/2 @ cent. discount.  
EXCHANGE ON New York 1 1/2; on London bankers, 49 1/2; Commercial, 49 1/2; Paris, 45 francs @ dollar; Mexican dollars, 33 1/2.  
LONDON Consols, 95 3/4; Bonds, 106 1/2.  
QUICKSILVER IN S. F., by the flask, 47 1/2 @ 47 3/4.

## Signal Service Meteorological Report.

Week Ending October 18, 1877.

HIGHEST AND LOWEST BAROMETER.										
Oct. 10	Oct. 11	Oct. 12	Oct. 13	Oct. 14	Oct. 15	Oct. 16	Oct. 17	Oct. 18	Oct. 19	Oct. 20
30.06	30.03	29.97	29.95	29.93	29.97	30.01	30.01	30.01	30.01	30.01
29.09	29.05	29.03	29.03	29.03	29.01	29.01	29.01	29.01	29.01	29.01
MINIMUM AND MAXIMUM THERMOMETER.										
63	63	61	62	67	75	72	72	72	72	72
53	54	52	55	53	54	54	54	54	54	54
MEAN DAILY HUMIDITY.										
82	70	75	86	71	36	58	58	58	58	58
PREVAILING WIND.										
SW	SW	W	W	W	NW	NW	NW	NW	NW	NW
WIND—MILES TRAVELLED.										
252	318	181	257	161	176	135	135	135	135	135
STATE OF WEATHER.										
Fair.	Fair.	Cl'dy.	Fair.	Fair.	Clear.	Clear.	Clear.	Clear.	Clear.	Clear.
RAINFALL IN TWENTY-FOUR HOURS.										
Total rain during the season, from July 1, 1877, 0.02 in.										

## OUR AGENTS.

OUR FRIENDS can do much in aid of our paper and the cause of practical knowledge and science, by assisting Agents in their labors of canvassing, by lending their influence and encouraging favors. We intend to send none but worthy agents.

J. L. THARP—San Francisco.  
B. W. CROWELL—California.  
A. C. KNOX—Pacific Coast.  
C. N. WEST—Santa Cruz, Monterey and San Benito counties.  
A. C. CHAMPTION—Tulare, Fresno and Inyo counties.  
JOSEPH DUMBLE—Mendocino, Humboldt and Del Norte counties and Oregon.  
W. D. WHITE—San Bernardino and Los Angeles counties.  
J. W. A. WRIGHT—Sacramento, Placer and San Joaquin counties.  
B. E. LLOYD—Alameda, Contra Costa and Napa counties.  
E. M. DENNY, Oregon.  
F. B. ALDERSON, Nevada.

EVERY new subscriber who does not receive the paper and every old subscriber not credited on the label within two weeks after paying for this paper, should write personally to the publishers without delay, to secure proper credit. This is necessary to protect us against the acts and mistakes of others.

WOODWARD'S GARDENS has the following new attractions: The buffalo chase; large whale skeleton; new museum; improvements in the zoological department, besides the other features which have made it popular.

"SPEAKS WELL," ETC.—We would return thanks for an exchange and back numbers of the MINING AND SCIENTIFIC PRESS, published by DEWEY & CO., of San Francisco, Cal. It is a well edited, interesting, and valuable journal and speaks well for our Pacific neighbors.—U. S. Milling and Manufacturing Journal.

## To Mining Secretaries.

An amendment to Section 336 of the California Code, taking effect July 1st, 1874, provides that in addition to the regular publication, daily or weekly, of the assessment and sale notices as heretofore,

## PERSONAL NOTICE

Must be served as provided in the following quotation from the law:

"The notice must be personally served upon each stockholder, or in lieu of personal service, must be sent through the mail, addressed to each stockholder at his place of residence, if known, and if not known, at the place where he principal office of the Corporation is situated."

The above refers to the ASSESSMENT NOTICE only. Advertisers in the MINING AND SCIENTIFIC PRESS will be furnished with copies of assessment notices printed on slips suitable for serving personal notice under this act at short notice.

DEWEY & CO., Publishers.

## Mining and Other Companies.

Persons interested in incorporated shares will do well to recommend the publication of the official notices of their companies in this paper, as the cheapest appropriate medium for the same.

**Excelsior Silver Mining Company**—Location of principal place of business, San Francisco, Cal. Location of works, Potosi District, Lincoln County, Nevada.

Notice.—There are delinquent upon the following described stock, on account of an assessment levied on the fourth day of September, 1877, the several amounts set opposite the names of the respective shareholders, as follows:

Names.	No. Certificates.	No. Shares.	Am't.
Antonovich, F.....	234	100	\$10 00
Barsi, M.....	232	50	5 00
Bini, L.....	232	50	5 00
Egan, John.....	232	100	10 00
Russo, S.....	233	25	2 50
Simi, M.....	233	50	5 00
Vidak, L.....	236	100	10 00

And in accordance with law, and an order of the Board of Directors, made on the tenth day of October, 1877, so many shares of each parcel of such stock as may be necessary, will be sold at public auction, on Tuesday, the twenty-third day of October, 1877, to pay the delinquent assessment thereon, together with costs of advertising and expenses of sale.

Office, 312 Post Street, San Francisco, Cal.

**Fresno Quicksilver Mining Company.**

Location of principal place of business, San Francisco, Cal.

Location of works, Mexico, Fresno County, Cal.

Notice is hereby given that at a meeting of the Board of Directors, held on the nineteenth day of September, A. D. 1877, an assessment, No. 5, of two cents per share was levied upon the capital stock of the corporation, payable immediately in U. S. gold coin, to the Secretary, at the office of the company, No. 414 California street, San Francisco, Cal.

Any stock upon which this assessment shall remain unpaid on the twenty-third day of October, 1877, will be delinquent and advertised for sale at public auction, and unless payment is made before, will be sold on the third day of November, 1877, to pay the delinquent assessment, together with costs of advertising and expenses of sale.

Office, 414 California street, San Francisco, Cal.

**Mariposa Land & Mining Company** of

California.—Location of principal place of business, San Francisco, California. Location of works, Mariposa County, Cal.

Notice is hereby given that at a meeting of the Board of Directors, held on the twelfth day of September, 1877, an assessment, No. 12, of \$1.00 per share was levied upon the capital stock of the corporation, payable immediately in U. S. currency to the Secretary at the office of the company, room 33, Nevada Block, No. 309 Montgomery street, San Francisco, California, or to the Assistant Secretary, at the office, No. 9 Nassau street, New York, N. Y.

Any stock upon which this assessment shall remain unpaid on the fifteenth day of October, 1877, will be delinquent and advertised for sale at public auction, and unless payment is made before, will be sold on Monday, the twelfth day of November, 1877, to pay the delinquent assessment, together with costs of advertising and expenses of sale. By order of the Board of Directors, LEANDER LEAVITT, Secretary.

Office, Room 33, Nevada Block, No. 309 Montgomery street, San Francisco, Cal.

POSTPONEMENT.—At a meeting of the Board of Directors of the Mariposa Land and Mining Company of California, held October twelfth, 1877, the delinquent day for stock on the above assessment was postponed until October twenty-ninth, 1877, and the sale day for such delinquent stock was postponed until Monday, November twenty-sixth, 1877.

LEANDER LEAVITT, Sec'y.

**Merced Mining and Water Company.**

Principal place of business, San Francisco, Cal. Location of works, Merced Co., Cal.

Notice is hereby given that at a meeting of the Board of Directors, held on the second day of October, 1877, an assessment (No. 1) of fifty (50) cents per share was levied upon the capital stock of the corporation, payable immediately in U. S. gold coin, to the Secretary, at the office of the company, at No. 226 Pine Street, San Francisco, Cal.

Any stock upon which this assessment shall remain unpaid on the twentieth day of November, 1877, will be delinquent, and advertised for sale at public auction, and unless payment is made before, will be sold on Monday, the tenth day of December, 1877, to pay the delinquent assessment, together with costs of advertising and expenses of sale. By order of the Board of Directors, F. T. HOUGHTON, Sec'y.

Office, 326 Pine Street, San Francisco.

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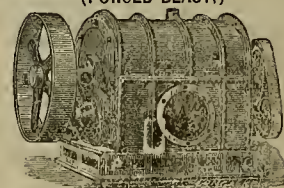
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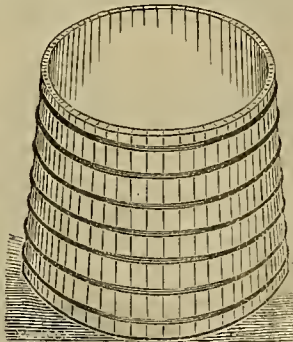
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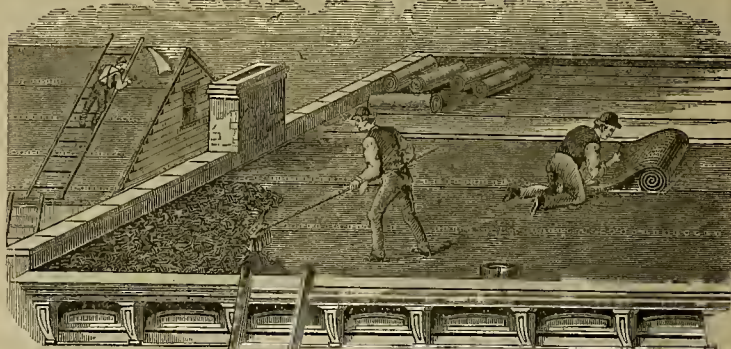
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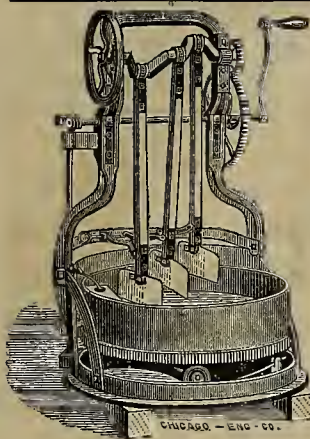
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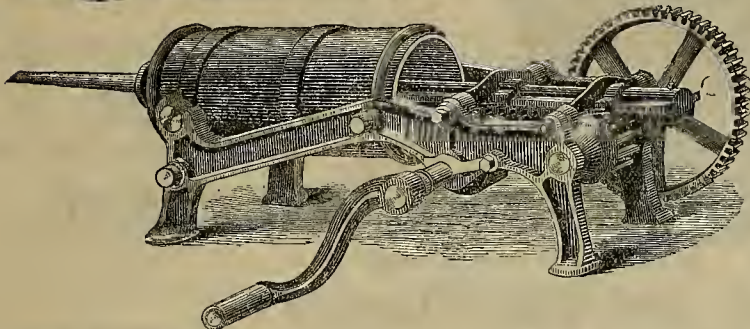
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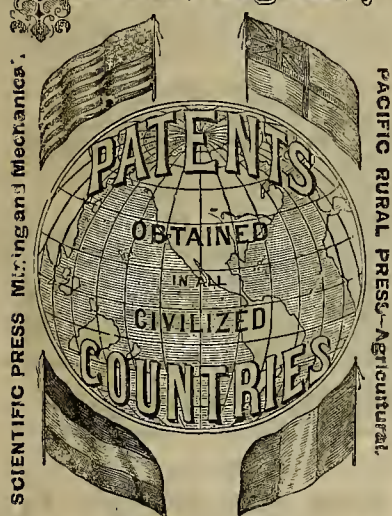
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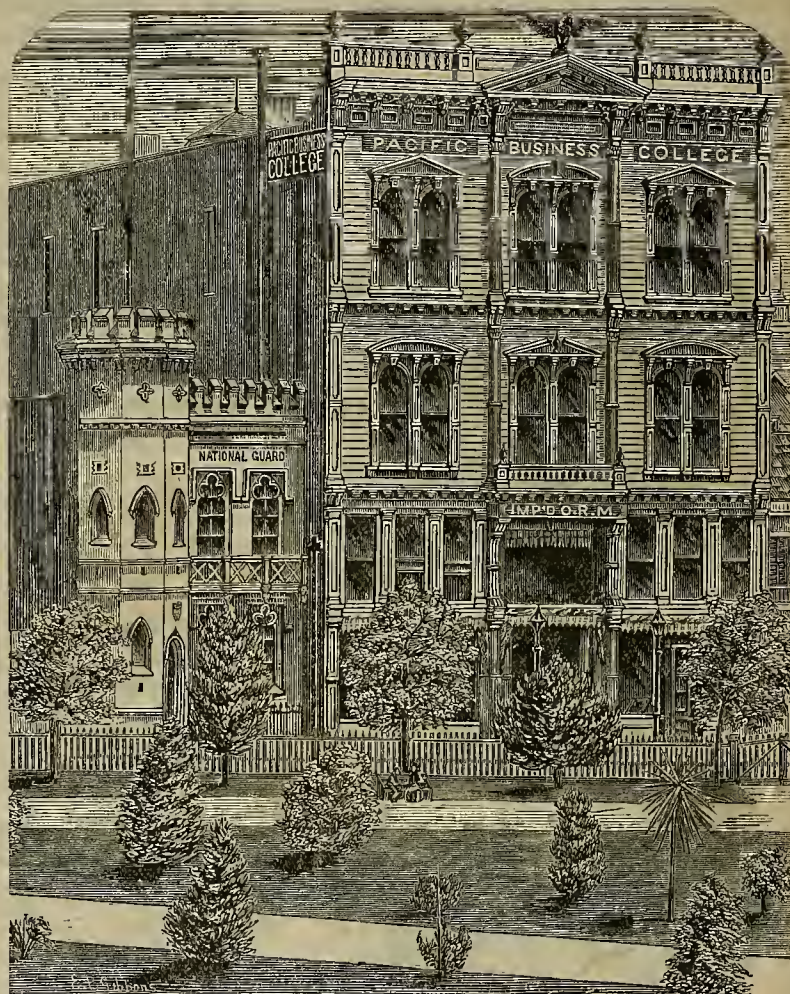
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# MINING AND SCIENTIFIC PRESS

An Illustrated Journal of Mining, Popular Science and General News.

BY DEWEY & CO.,  
Patent Solicitors.

SAN FRANCISCO, SATURDAY, OCTOBER 27, 1877.

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Number 17.

## Notices of Recent Patents.

Among the patents recently obtained through Dewey & Co.'s SCIENTIFIC PRESS American and Foreign Patent Agency, the following are worthy of mention:

**IMPROVEMENT IN SAW MILL SET WORKS.**—J. A. Robb, S. F. The principal object of this invention is to combine a hinged supplemental stop attachment with the quadrant beside which the set lever of a saw mill set-works operates, so that it can be used to shorten the throw of the lever when it is desired to take out the width of the saw kerf in sawing planks of more than the usual thickness. The stops usually employed for limiting the movement of the set lever are permanently adjusted to a certain thickness of board, so that each throw of lever will move the head blocks a specified and uniform distance. If, however, it be desired to saw a board of double thickness and the lever is given two throws or motions, each throw stopping at the permanent stop, it is evident that the board will have an excess of thickness equal to the width of the kerf, which the saw would have renewed if it had been run through the log after the first throw. Mr. Robb's supplemental stop is intended to obviate this difficulty by limiting each motion or throw of the lever after the first motion of the lever has been once made in the ordinary way, sufficiently to take out this excess of thickness. The invention also includes a weighted brake for preventing the momentum of the hand wheel from rotating the screw shaft beyond the point to where it is carried by the lever. Also an improvement in the screw rods which move the head blocks.

**PRESERVING PILES AND LUMBER.**—John P. Culver, S. F. This invention is a means of preserving timber and piles, more especially against the ravages of the teredo and other destructive marine insects. It consists in wrapping or otherwise coating the timber to be preserved with burlaps or other suitable fibrous material, which has been saturated with asphaltum, coal-tar, petroleum, or other bituminous or preservative material, the fiber serving as a bond to retain the preservative in place. It has been noticed that as long as the bark remains on a pile it will not usually be attacked by the teredo, but the action of the water, chafing by vessels, etc., serves to abrade the pile sooner or later, after which it is immediately attacked. The invention and process is not only to preserve the pile by the quality of the material employed but it also serves as a wrapping which will prevent the bark from being easily rubbed off, so that in the case of any timber with the bark on, it acts as a double preventive.

**COIN WRAPPERS.**—Rodger L. Ryan, S. F. For convenience in handling silver coin it is usually made up in rolls in specific amounts, and when a large amount of money is paid in silver these rolls pass current for the supposed amount contained, as it would be a severe task to unroll and count the coins in each package. Unscrupulous persons take advantage of this fact and sometimes insert counterfeit coins or make the package short or introduce pieces of base metal of equal weight. To obviate this the improved coin wrapper is made. This is so constructed that it exposes the edge of each coin in the roll and the entire face of the coin at each end. It is more convenient than those now in use.

**ROD COUPLING.**—Theodore D. Culter, Westminster, Los Angeles county. This invention relates to an improved coupling for connecting such rods as are used in boring artesian wells, and are also to be used for connecting other tubes and rods where great strength is required, and rapidity in connecting and disconnecting the pipes or tubes is required.

**COPPER IN LIVERPOOL.**—The price of copper has fallen still lower in Liverpool. Quotations for ore on the first inst., according to James Lewis & Son's report on ores and metals, were 12s. to 12s. 6d per unit. Chile exports for this year up to Sept. 15th have been 34,813 tons fine, as against 40,685 tons at the same time last year.

## The Rains.

The dust lies motionless at the command of the clouds. The air is washed of its smoke and haze by the drops which have quite freely fallen. From north to south and across the breadth of the State, the downfall was enough to darken the ground hues and so change the view which meets the eye and the air which falls upon the cheek, that all have surely that the season for moisture and for growth has come.

As our rains this year have made a record of commencement in October, it is of interest to note that the same starting point in former years has given a fair sequence in the majority of instances. For the last seven years the time of beginning and the final result may be noted thus:

Year.	Month.	Inches for the season
1871-72	October 27	30.66
1872-73	September 26th	17.52
1873-74	October 8	24.93
1874-75	October 9	20.56
1875-76	October 27	31.19
1876-77	October 10th	11.04

Thus it appears that, though a beginning in October brought us drouth last year the case was quite exceptional, and an inference adverse to October rains is contradicted by taking into

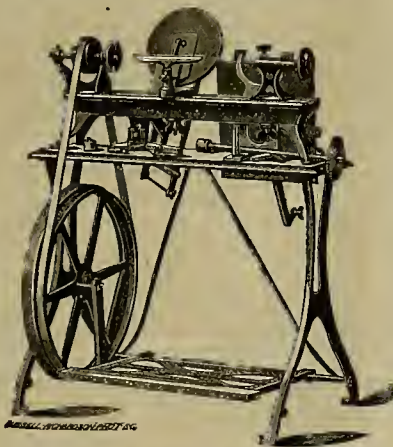


Fig. 1 LATHE READY FOR TURNING.

account a few preceding years. Although the final result is as above laid down, there are reasons why a beginning of rain in November is better than when coming earlier, but who knows that we shall not enjoy combined blessings this year?

The hydraulic miners will soon be busy again after a season of comparative quiet, during which they have been getting their claims in order. Soon, however, the ditches will be full again and the big streams will be washing the gravel down the flumes in a manner to make the miners rejoice.

**MINES ON AGRICULTURAL LANDS.**—A correspondent asks us whether, if he discovers a mine on agricultural land, he can patent said mine. The answer is that in case valuable deposits of mineral are discovered upon legal subdivisions of the public lands, after the same have been entered as agricultural, but before patent has issued therefor, the parties claiming the possessory right to said mine may make application for patent for it, and the agricultural entry will be canceled to that portion of the tract embraced by the mining claim. This is in brief a decision of the Commissioner of the General Land Office in March, 1873.

ONE day last week a man by the name of James McGee walked to one of the shafts of the Oneida mine, Amador county, and deliberately leaped headlong into it to a depth of 600 feet, causing, of course, almost instant death. He was a man of steady habits, but had poor health, and is supposed to have been mentally deranged at the time he committed the rash act. The deceased was a single man, a native of New York, and aged about 43 years.

## Locations and Expenditures on Veins.

There is no provision of law to prevent parties from locating other claims upon the same lode, outside of the first location made on the vein or lode. If a lode of 3,000 feet in length is discovered, two locations may be made, of 1,500 feet each; but the necessary expenditures and work required by the laws of the United States and the local regulations must be made on each separate claim. That is to say, \$100 worth of work a year will protect 1,500 feet from liability to relocation, but not the whole 3,000 feet, as that expenditure is required on each claim.

Miners must recollect, moreover, that before a patent can issue to a claim, \$500 must have been spent in labor or improvements. This \$500 expenditure must be shown upon the plat and filed notes of the classes of claims mentioned in the Mining Statutes. It may be as well to state also that the Commissioner of the General Land Office has decided that if a party applies for a patent to a relocated mine, it will be necessary for him to offer satisfactory proof that a sum not less than \$500 has been expended upon the mine by the applicant or his grantors. The fact that \$500 has been expended upon the

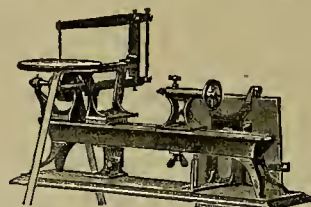


Fig. 2 JIG SAW READY FOR USE.

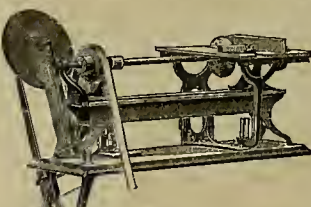


Fig. 3 CIRCULAR SAW IN POSITION.

claim by a person or persons who subsequently abandoned it, will not relieve the applicant from the necessity of showing that he or his grantors have expended thereon the amount required by law.

**THE WOODRUFF SCIENTIFIC EXPEDITION.**—The N. Y. World of Oct. 22d says: It is now definitely announced that the Woodruff scientific expedition around the world will not start before June 1st, 1878, as it has been found upon examination that the steamer in which the voyage was to have been made is unfitted for the purpose. The Directors, therefore, contracted with John Roach to build a new one, especially arranged for the expedition, to be ready by the 18th of May. This vessel is to be 325 feet long and 40 feet wide and will contain the latest and best improvements in machinery, and he one of the handsomest and strongest steamers afloat. The plan and route will remain substantially the same as heretofore published, except that the route will be almost reversed, going first to England and thence to France and to the great exposition at Paris, possibly to St. Petersburg, and on the return voyage visiting the Sandwich islands and San Francisco, and from there, probably to Peru, the Society islands and the Fiji islands, and thence home, via the Straits of Magellan, being absent two years. Details are now in course of preparation. The same educational plan and purpose will be maintained in every particular, with substantially the same management, officers and faculty.

The Baltimore Con. mining company has increased its capital stock from \$5,400,000 in 54,000 shares to \$8,400,000 with 84,000 shares.

## Hendy's Concentrators and Feeders.

Joshua Hendy shipped away last week seven of his "\$1,000 Challenge Ore Feeders," four of which went to the Plumas National mill, two to Amador county, and one to eastern Nevada. There are now over 250 of these machines running satisfactorily to the purchasers. Mr. Hendy has just made a contract to put in operation at a mill near Greenville, Plumas county, four of the Challenge feeders, and eight concentrators, subject to the approval of the company. The payments for these machines are to be made from the savings of the concentrators, less the cost of labor in attending to the same.

It is understood that as the concentrators save amalgam, or sulphurets, the total product shall become the property of Mr. Hendy, and credited to the amount of purchase of the machinery. In the event of failure to save any amalgam in paying quantities, he is to have the sulphurets, and the company are to furnish the power and a pan to work them, the net proceeds to be applied to paying for the machinery. All the expense of freight, setting the bed timbers, belts, shafts, pulleys and labor of placing the whole is to be paid by Mr. Hendy, and is included in the contract price. This is a somewhat unusual contract, but shows Mr. Hendy's faith in his concentrator, and also in the mine. On the other hand the company pay a double price for the machinery, which has to earn the money itself. The mill is in the neighborhood of the Green Mountain and Gold Stripe mining companies' property.

## The Combination Lathe.

The illustrations on this page represent the "combination lathe," for the use of amateurs and mechanics who desire to economize both in cost of, as well as in space occupied by, their tools. It is a simple foot lathe, with which are combined both a jig and circular saw all mounted on the same bed, both swinging back out of the way when not in use. Fig. 1 shows the lathe ready for turning, with the jig and circular saws thrown back. Fig. 2 represents the jig saw in position for use; and Fig. 3 the circular saw in position for use. This tool can be seen at Dunham & Carrigans, 107 Front street, where are also other styles of lathes, both large and small. The combination tool a good one for a Christmas present, being both useful for amateurs and mechanics.

**HYDRAULIC MINING.**—The article on this subject from the pen of the well-known engineer, Aug. J. Bowie, Jr., which is now being published in the Press, is an especially valuable one, and our hydraulic mining friends will find it worthy of preservation. It was read before the American Institute of Mining Engineers, as one of their papers, and will only appear in their transactions and not be published for sale. There is, therefore, no other way of obtaining the article except by keeping the files of the Press. The facts and figures given are of great value as showing the results of practical work. A reliable article of this kind is more profitable for miners to read and study than any other class of literature. We advise those who do not usually file away the Press to commence keeping their numbers now and they will have this standard article as a whole. It has been carefully revised and corrected by Mr. Bowie and comprises the whole literature of hydraulic mining in California.

**LINING OF THE BOWMAN DAM.**—All the water of the Bowman reservoir of the North Bloomfield gravel mining company having been drawn off this season, the lower water face of the dam is now, for the first time in eight years, exposed to view. The lining, formed of three-inch pitch pine planking, firmly spiked to supports 18½ inches apart, has maintained a pressure of 67 feet (nearly 30 pounds to the square inch) and is found to be in perfect order without a sign of giving to the great pressure.



## CORRESPONDENCE.

It is the desire of the editors of this journal to be liberal toward all correspondents, and therefore statements and opinions are frequently published, on the authority of the writers, for which we do not assume responsibility.

### Shall the Salmon be Exterminated?

EDITORS PRESS:—It gave me much pleasure to see the letter of Mr. T. T. Williams in your paper of the 6th instant. If we can get intelligent fishermen like Mr. Williams to discuss the question of fish culture, and to admit the necessity for any law for the preservation of fish in our waters or to concede that it is necessary that some fish be allowed to reach their spawning grounds—that the species may be preserved—it will not be long before this subject will be fully understood. A full discussion will show the fishermen that their true interests, looking to the future, is in an honest observance of proper laws, made with the sole purpose of continuing and increasing the supply of fish in our rivers, so that those who come after us shall find them as abundant as we found them.

I desire to correct some errors into which Mr. Williams has fallen; and one is as to there being two different varieties of salmon in the Sacramento river. Mr. Williams is mistaken as to the fact when he calls the hooked-mouthed or black salmon, a different variety from the salmon that has not the hooked mouth. The habits of salmon in fresh water have been thoroughly studied by scientific men, learned in ichthyology, and both of these fish are identical as to the species and variety. The salmon when it first comes in from the ocean, is bright and silvery. After it reaches fresh water it ceases to eat, and as it continues in fresh water its scales are absorbed and its skin turns black; it becomes hook-mouthed, and dogs' teeth or tusks are developed. As Mr. Williams says, they are never seen in the river until August, for it takes a month or two after they reach fresh water for these changes to become developed. These changes are further developed as they ascend to the head of the stream for the purpose of reproduction, and probably a salmon taken from there would be called a third variety, and, in fact, is occasionally called the dog-toothed salmon. But all these fish are identical, all one species and variety of salmon, which have undergone changes connected with their removal from salt to fresh water, and also connected with the alterations in their system consequent upon the reproductive instinct.

Mr. Williams and the 50 salmon fishermen whom he represents, would commit a grievous error in fixing upon the month of July as being the only proper month for the close season.

In this I fear he and his friends look only to their temporary interests and immediate profits and not to the perpetuation of the business and the interests of the public.

A Committee of the Legislature obtained the evidence of very many of the most intelligent fishermen on the river, as to what particular season the largest quantities of fish were ripe, and when, looking to the interests of the fishermen and the public, would be the best time in which to permit a portion of the ripe fish to reach their spawning grounds. This they decided to be from August 1st to November 1st. The concurrent testimony of these fishermen was that there were two runs of salmon in the Sacramento; the spring run, which commenced in November and ended in July—having its greatest strength in May; and the fall run, which commences the first of August and ends about the 15th of October. It will be seen that the fishermen have all the spring run without restriction, and one-half the fall run, the law intending that the other half of the fall run should be allowed to reach their spawning grounds; therefore, if July should be selected as the only month in the year for a proper close season, as Mr. Williams suggests, it would be a month taken between the spring and fall runs, when there are scarcely any fish in the river to spawn. This would not be just to the public interest, and its effect would be to exhaust the river of fish in a very few years.

A fisherman of more than 20 years on the Sacramento, and who really desires to see the supply of fish kept up, in writing to me on this subject says: "I am glad that your Commission assumes an aggressive attitude, looking to the execution of the law for the protection of salmon. I must admit there is no reasonable doubt that in the absence of such an action, the ever increased demand for fish as a staple in commerce, would have resulted in the extermination of the species in these waters. The catchers and cannerymen would have realized the fabulous story of the party who killed the goose that laid the golden egg. The close season should on no possible line of pretense or persuasion be pressed outside of the months of August and September to give opportunity for fishing in those months. Right there is the life of the matter. The regularity, the multitudes and urgency of the seed run, the consequent ease and certainty of the catch, the fine weather for work, all present a weighty temptation to catcher and cannery. Look out for the grand assault on these two months in the Legislature this winter. If they press you hard this winter you should fight for the last half of August, in

some connection, as the Jews fought for their temple."

These are the opinions of a fisherman who follows the business and catches fish for the canneries and the market of San Francisco. There can be no question about the facts. It hardly requires argument and it seems to me it is hardly open to discussion. The great body of fish come into the river to spawn in August and September. Shall a portion of them be permitted to reach their spawning grounds to deposit their eggs? If so, the fish should not be caught during this period, and this constitutes what should be the close season.

If Mr. Williams and his 50 friends will reflect that something should be done toward keeping up the supply of fish, and that to do this it is necessary that some ripe fish of the fall run should have an opportunity to go to their spawning grounds, I think, will concede that out of the whole 12 months the fish should have August and September, and not July, when the few fish in the river are made up of part of the spring run and the beginning of the fall run.

I am very glad to know that so many fishermen are willing to discuss these questions, as I am satisfied if they will give their views we shall soon get at all the facts, and they themselves will, in the end, be convinced that the Legislature and the Commissioners are not their enemies, but desire to continue and increase the fish in the rivers for their benefit, and also for the benefit of the public. B. B. REDDING.  
San Francisco, October 11th, 1877.

### Plumas County Mines.

EDITORS PRESS:—I wish to give you some notes on the mines of this county, that have come under my actual observation, in the vicinity of Greenville, during my brief stay here. The Gold Stripe mine, on Wolf creek, was discovered some years ago by an old resident of Indian valley, Mr. John Lowrey, but he being at the time unable to work it and there being but little interest taken in the mines then, he failed in getting capitalists interested; not keeping his location good, it was subsequently relocated by A. McIntyre. The mine has paid from the "word go," and the company, of which E. Green, of Oakland, is a member, are pounding away on pay ore night and day, with a 24-stamp mill. The ledge is from 2½ to 40 feet thick, and widening as it goes down. The ore of this mine—as well as all the mines in the district—is of low grade, but yet is worked with a profit on account of the superior advantages of working the mine and milling the ore. The ledge is easily worked with pick and shovel. I have not heard a blast since I have been in the district. Timber is very abundant. Water facilities are excellent, and ore can be worked at a profit of as low a grade as \$4 per ton. The very fact that the ore is not base and easily worked, and that low-grade ore can be successfully worked, is proof of the permanency and future prosperity of the camp.

The company intend to put up a new mill in the spring, as soon as the tunnel, which they are now running on a level 160 feet below the present tunnel, reaches the ledge. They are in on this tunnel 550 feet, and will strike the ledge about 380 feet below the surface, at a distance of 900 feet, which event they expect to celebrate next May.

#### The Wisconsin Mine.

This mine is situated about one-quarter of a mile from the Gold Stripe. The principal owners are C. H. Lawrence, H. J. Hathaway, John Taylor and Ed. Shattuck. The company have run a tunnel some 200 feet long, and are taking out pay rock, principally decomposed quartz. The ore vein varies in width; it is 15 to 20 feet wide. The foot wall is serpentine, and hanging wall slate. Mr. Shattuck assured me that the cost of mining and milling this ore did not exceed \$2 per ton. The company have a 10-stamp mill, and a frame large enough to admit five more stamps. Sufficient water runs from the tunnel for milling purposes. The prospects of this mine are very encouraging. The mill has only been running two or three weeks. What the average yield of the ore per ton is I did not learn, but have since heard that it was about \$15.

#### At the New York Mine,

One mile south of Greenville, the company are still at work taking out ore that is paying well. A 10-stamp mill run by water power is in constant motion; capacity, 15 to 18 tons per day. The ore heretofore has been averaging about \$8. It is now averaging about \$12. The superior advantages of working the mine and milling the ore renders its actual expense only about \$2.50 per ton; the mill started last April. The ledge averages about three feet wide, the ore being of a grayish color. The vein or pay chnte is about 240 feet in length, and has been prospecting to a depth of 300 feet. They are now milling ore from the 300-foot level. Another tunnel has been commenced 250 feet below the one from which the ore is now taken, which will strike the ledge at about 550 feet in depth. The tunnel will be about 800 feet long. The company expect to reach the ledge about May, 1878. The company consists of J. H. Whitlock, member-elect to the Assembly from Plumas and Lassen counties, and Thos. Lreaven, who are

the owners and personally work and superintend the mine. It pays \$100 net, daily.

#### Soda Creek District.

The Monitor and Jefferson mines, located last April, are owned principally by G. M. Compton, Frank Williams and Walter Stanley. The mines are being worked by the company, who are taking out ore and milling it at the old Kettle mill, at Round valley, about five miles from the mine and two and a half miles from Greenville. The Monitor is opened 600 feet on the surface, showing a well-defined ledge the entire distance. A tunnel is being prosecuted, and is now down on the ledge on a slight incline about 300 feet. The company have been at work since the discovery was made constructing a graded road about five miles long to a mill which they have leased to work the ore. From several assays made from different portions of the ledge, it ran from \$280 to \$500 per ton. The company are sanguine that they have the best mine in the district, and from the way they are handling it will undoubtedly realize handsomely from it. The vein lies nearly flat, and averages from five to seven feet in thickness.

The Arctic and South Arctic are located parallel with the Monitor and Jefferson. A tunnel is run on the Arctic 90 feet, and on the South Arctic 250 feet, and shows good ore. The company expect to build a large mill close to the mine in the spring.

#### Plumas National.

This was formerly the Washington mine, and is situated on Soda creek, about half of a mile below the Monitor. This company are working about 30 men. The ledge is about three and a half feet wide on an average, and is different from anything I saw in the district. The ledge is solid quartz, principally white, and shows rich in free gold. The principal owners are C. H. Lawrence, Chas. Reed and Joseph Hall. Their new 20-stamp mill started up on the 3d inst., and ran through 35 tons of ore, making a clean-up of \$459. They have a tunnel run in 300 feet on the ledge, which shows well, and it improves as they go in. The ledge dips at an angle of about 40°. The people all express unbounded faith in the mines in Soda Creek district.

I had not time to visit the Green Mountain mine, but am informed that it is being worked as steady as a clock and yielding well.

Indian Valley is worked at a depth of 800 feet, and shows a good fissure vein at that depth.

#### Greenville.

This town is situated at the foot of the mountains below the mines, in the upper part of the lovely Indian valley, and is one of the liveliest camps on the Pacific coast. It has grown up with wonderful rapidity since the discovery of the Soda creek mines, which promise to be very productive. I observed no less than 30 new buildings going up—many of them two-story houses, and some very fine ones. Greenville can boast of the largest hotel of any town of its size on the coast, it being about 120 feet square and can accommodate 150 guests. The building is two and a half stories high, hard finish, high ceilings and pleasant rooms. It is doing a "slashing" business, full and running over all the time. The dining room is roomy and can seat about 100 at a time. There is also a fine saloon, barber shop, hot and cold water baths, etc. The town is constantly increasing in population, many kinds of business being well represented. Of the several mercantile establishments, the largest is that of McBeth & Compton. A. Thom has a machine shop and foundry, employing about 15 men; he makes all kinds of castings. His furnace has the capacity to heat six tons at a time. They have on hand orders enough to last them nearly all winter. A sash and blind factory is adjacent to the foundry. McBeth & Compton are erecting a large two-story fire proof warehouse. The upper story is intended for a hall. Among other buildings is a large three-story flouring mill. The second story is used for an Odd Fellows' hall. There are several saw mills in the vicinity, run by both water and steam. The town is regularly laid out, and real-estate owners are clearing off their land, preparing for the spring demand, and in my judgment will not be disappointed in their expectation of opportunities to sell. There will unquestionably be a general move in the direction of Greenville next summer, and it is only surprising that the rich mines of Plumas county have remained undeveloped so long.

#### How to Get There.

For the benefit of parties going to the new gold diggings, or that may go in the future, I would say that it is easily accomplished over the graded road of Dennis H. Chapman, who runs a line of stages from Reno to Greenville, leaving Reno Mondays and Thursdays at 6 o'clock, A. M., and often when occasion requires. The fare is very reasonable, only \$11 for a distance of 93 miles, a considerable of the way over a heavy though good grade. The accommodations on the road are good. The stage stops at hotels over night, which gives the traveler abundant opportunity to rest. The scenery from Beckwith's to Greenville is delightful. We enter the immense forests of pine, fir and cedar a few miles from Beckwith's, which is a pleasant change from the dry and dusty sagebrush plains and sandy deserts. As we raise the grade, to our right may be seen high, towering rocks and peaks of mountain tops, which resemble in appearance many of the noted scenes of the famous Yosemite valley. A few miles from Bagley's we strike mountains of iron, which present a peculiar appearance. From the action of the wind, rain, cloud-bursts, etc., there are formed

numerous towering peaks. These high towers are honey-combed by the action of the elements, and the cells afford homes for the vultures. A few miles farther up, at the top of the grade, at a point called Cape Horn, where the sleighs of winter are exchanged for coaches, we get a panorama of the valleys and mountains. I shall not attempt a description of the scene. It is magnificent, and it is worth the pains of the lovers of scenery to visit this picturesque spot. Here we commence the descent of the mountain, following the windings of Indian creek, filled with speckled trout and other fish. In the mountains around us are found the bear, deer, grouse, quail, etc., which afford sport for those who delight in hunting. Early in the afternoon of the second day we are landed at Greenville hotel, feeling that we have been amply repaid for our trip. F. B. A.

### A New Tunnel Project.

The Owyhee (Idaho) *Avalanche* says: The proposed project for tunneling Florida mountain is one of vast importance to this section of the country, and the sooner the enterprise is commenced the more certain will be the approach of prosperous times in this vicinity. Our best and most experienced mining men entertain the belief that the interior of this mountain is one vast net-work of veins, of which the Knott ledge, as developed thus far, is but an ordinary sample. At a greater depth the ledges will undoubtedly prove to be better defined, greater in extent, and showing up more prolifically in gold. The diggings that have been encountered on the stream directly below this mountain during the past few years, furnish the best evidence of the great wealth that exists there, and the certainty that the fountain head has a liberal share of the precious metals that generations yet to come must reap the advantage of. The gold taken out of these streams for several seasons is directly traceable to this mountain, whose formation is such as to furnish the very best evidence of the existence of ore bodies there on a large scale and in great profusion. The running of a tunnel as proposed by a new company, which we are pleased to learn is now in a fair way to be organized, will tap the ledges at a depth of several hundred feet, and aid in bringing to light the hidden wealth embodied in the heart of a mountain hitherto revealing such splendid indications. We believe that no more profitable mining enterprise could be engaged in anywhere at the present time.

### Marshall Tunnel.

Several hundred feet of this tunnel have recently been retimbered. The drifts, level, etc., connected with it—in fact the entire property of the Marshall silver mining company—have been securely repaired preparatory to extensive development, the total amount of new timber work being about 7,000 feet. This has been done at considerable expense, but it is permanent, and will probably stand 10 years without further attention. The engine, which has been shut down for repairs for several months, starts up again this week; its first task being to hoist 150 feet of water out of the deep shaft. It is 15-horse power, and capable of hoisting 40,000 gallons of water every 10 hours. It will be run night and day, and is expected to clean out the water in three days. When this is accomplished the work of sinking the deep shaft will immediately be resumed; and the company intend to sink it down 1,000 feet below the level of the Marshall tunnel. This is on the middle of the Colorado Central lode, and crosscuts will be run 60 feet apart, to the north and south walls. This lode never looked better than it now does, a large amount of ore being in sight.

Negotiations are now pending for the erection of concentration works in connection with the Colorado Central mine, to work up about 3,000 tons of low grade ore which is now lying on the dump, and for the further purpose of reducing a large amount of ore for concentration which is now in sight in the mine.—*Colorado Miner*.

### The Pony Mill.

J. C. Frick has just completed and set in operation a four-stamp mill for working ore from the croppings of the Sierra Nevada lead. The mill stands in the ravine just south of the Odd Fellows' cemetery. The mill building is 20 by 38 feet in size. The stamps weigh about 400 pounds each and are driven by an eight-horse power engine. At present the ore is being worked for gold only and most of the amalgamating is done in the battery, though below, in sluices, are copper plates coated with quicksilver. On these is caught the gold that passes out of the battery. The ore worked contains a considerable amount of silver in the form of chloride, and Mr. Frick contemplates putting up an amalgamating pan in which to save this at no distant day. The little mill is called the "Pony," and is capable of crushing six tons per 24 hours. Mr. Frick has on hand at the mill about 50 tons of ore, and some 15 tons more at the mine. By proper assorting the rock pays well for working. Pieces of quartz are frequently found that show a plentiful sprinkling of free gold. Mr. Frick commenced operations with a four-stamp toy mill, which crushed but about a ton per day, doing all the work himself. Four men will be required to run the new mill. There are undoubtedly many places on Cedar hill where ore that would pay well for working could be found by a little assorting.—*Virginia Enterprise*.



## MECHANICAL PROGRESS.

## The Cause of Blisters on Steel.

In the process of making steel, which is so largely practised at Sheffield, bars of iron, usually of Swedish or Russian manufacture, are imbedded in charcoal powder, and kept heated to bright redness during about a week or ten days, according to the degree of carburization desired. Carbon is thereby imparted to the iron, and steel is the product. The bars operated upon are generally about three inches broad and three-fourths of an inch thick. How the carbon finds its way even to the center of such bars, is a question not yet satisfactorily solved, though it possesses high scientific interest, and has been much discussed. At the late meeting of the English Iron and Steel Institute, a paper was read by Dr. Percy, the object of which was to communicate to the Institute experimental evidences as to the cause of the singular phenomenon which accompanies this process of converting iron into steel, viz., the occurrence of blister-like protuberances on the surfaces of the bars. This appearance is so characteristic and so constant, that the name of "blister-steel" is applied to such bars. The protuberances are hollow, exactly like blisters, and vary much, both in number and size; some are not larger than peas, while others may exceed an inch in diameter, and they are always confined to the surface of the bars, for there is a specimen of "blister-steel" in Dr. Percy's collection, in which there is a single blister as large as a small hen's egg, protruding equally from each of the opposite surfaces of the bar. Dr. Percy concluded that it had been conclusively proved that all bar iron manufactured by charcoal finery processes, or by puddling, must contain, intermixed, some of the slag, which results from the conversion of pig-iron into malleable iron by such processes, in which, let it be remembered, the malleable iron is never actually melted.

On a visit to the great steel works of Messrs. Firth, at Sheffield, in February last, Mr. Chas. H. Firth undertook at Dr. Percy's suggestion, to settle the question whether blistering would occur in the converting process in the case of a bar of iron which had been actually melted and so freed from all intermixture of ferrous silicate or magnetic oxide of iron. The experiment, says Dr. Percy, "was accordingly made, and with good effect, of confirming, and, I think I might almost say, establishing the correctness of the explanation which I ventured to submit concerning the cause of the formation of the blisters. On the 9th of last May, Mr. Firth informed me that he had melted Swedish bar iron, and cast it into a flat ingot, which he had carburized in the converting furnace in the usual manner; and, at the same time, he forwarded to me a piece broken from the ingot after conversion; this piece was about six inches long, three inches broad, and a little more than half an inch thick; it showed a fracture at each end, characteristic of converted steel, but there was not the slightest indication of a blister."

**METHOD OF SHRINKING ON TIRES.**—The beating of tires by means of hot water instead of by direct contact with fire is brought forward through English sources. It has thus far been applied to railroad work, but possibly it is susceptible of other applications. The record of the late experiments is as follows: The expansion of tires by hot water, though not claimed to be new, is believed by the author to be much superior to the ordinary method of using fire. As applied on the Moscow-Nijni railway, an iron tank, one-fourth filled with water, is fixed near a stationary boiler, a steam pipe from which is led through it, capable of heating the water to 212° Fahr. Into this the tire is plunged by means of a portable crane, and after an immersion of from 10 to 15 minutes, is taken out and immediately placed on the wheel. Three men only are employed, who will fix from 12 to 14 tires in a day of 11 hours. The allowance for shrinking (the difference between the diameter of the skeleton and that of the tire) is 0.75 millimeter to a meter. This is ascertained by gauges of great accuracy, and, if deviated from, the tire will be either loose after cooling or too small to get on the wheel. When fire is used, the tire can never be heated equally or cooled equally in all parts, and, in consequence is sure to be more or less oval in form, which is not the case in hot water. The above railway made a comparison between the two, the results of which are given. It appears that, during a six years' trial of fire-shrunk tires, 37% ran loose and 5% were broken; while, during a three-years' trial of water-shrunk tires, less than 1% ran loose and only a single tire was broken. The liability to breakage in the former (produced by the irregularity in form) is much insisted on by the author as being, of course, far more dangerous and costly than the mere loosening of the tire.

**RIVER BED MINING.**—About 50 anchors and an immense quantity of chain were raised from the bed of the St. Lawrence river, Quebec, recently. This nest of iron was the accumulation of years, and took the lifting barge about a month to effect the raising.

## Export Trade in American Manufactures.

There recently assembled in Philadelphia a body of men connected with our manufacturing interests, forming "a convention of the associated industries of the United States." We know nothing of the association, except that the *Western Manufacturer* speaks in favor of it. We read that it devoted time to devising ways and means for practically relieving our overcrowded markets, and paving the way for a large production, and thus providing for the employment of the thousands of workmen now idle, and suffering all the hardships of such a condition. A committee was appointed to make investigations in regard to foreign markets with a view to increasing our export trade, to place samples of American manufactures in all foreign markets, and demonstrate their superiority over those of other nations, and also to learn and report the special kind and quality of goods most in demand among nations with whom we have heretofore had little or no trade. This committee in a report already submitted, say: "Enough has already been done to justify the present reference to it, and to show the need of some precautions. In the few months of the present year, the direct export of Philadelphia manufactures in new articles, not sent in any quantity previously, is about two millions of dollars in value, and the indirect export by way of New York much greater, so many being sent there for shipment." Among the classes of manufactures in which an export trade has been established, may be mentioned "wood-working machinery, hydraulic works, including pumps, the higher forms of agricultural implements, house building and bridge building appliances, cotton and woolen machinery, cotton prints, bleached cottons, gingham, and various forms of colored cottons, cotton mixed goods, worsted goods of various classes, gas meters and gas works, carriages and carriage equipments, leather, ladies' and children's shoes, oil cloths, hats, caps and straw goods, drugs, paints, books, paper and stationery, scales and balances, hardware and tools of every class, lawn mowers, etc."

**ARTIFICIAL BLACK WALNUT.**—A Belgian journal says a new process has been applied to the manufacture of artificial black walnut, by which ordinary wood has imparted to it the appearance of the most beautiful specimens of walnut, adapted to the very finest cabinet work. The wood, first thoroughly dried and warmed, is coated once or twice with a liquid composed of one part by weight of extract of walnut peel, dissolved in six parts of soft water, by heating it to boiling, and stirring. The wood thus treated is, when half dry, brushed with a solution of one part by weight of bichromate of potash in five parts of boiling water, and, after drying thoroughly, is rubbed and polished. The color is thus said to be fixed in the wood to a depth of one or two lines, and, in the case of red beech or alder, for instance, the walnut appearance is most perfect.

**FLOORING TILES OF ASPHALT.**—The London *Building News* states that at the Bavarian Industrial Museum may be seen a collection of square tiles of asphalt prepared by a new process, and intended for floorings. The tiles are ornamented with mosaic, in white china or colored glass, which may be arranged according to any design. The drawing to be reproduced is traced on a sheet of thick paper, which is afterward covered with the various fragments of china or glass, which will form the mosaic; a border is made to the sheet, and boiling asphalt poured upon it. After the whole is cooled, the paper is taken away with cold water, and the tile is finished. A flooring covered with such tiles bound together by a string of asphalt appears to have been made by a single melting, and has a good appearance. It indefinitely resists damp, and is consequently useful in bathrooms, halls of houses and balconies.

**IMPROVEMENTS IN THE CAPITOL AT WASHINGTON.**—The *American Architect* says that the new ventilating and heating apparatus of the hall of the House of Representatives has proved to be a great success. The new plan was introduced by Edward Clark, architect of the Capitol, in accordance with the report of the board of United States officers, convened at the request of the Committee on Public Buildings in the last House. An appropriation of \$33,000 was then made. The fresh air is now taken direct from the grounds of the capitol, through the terrace, and is tempered by the warm air in winter from the hot water coils, while in summer it is thrown into the building direct from the grounds. A series of ventilators to carry off the foul air have taken the place of some ornamental pendants in the ceiling.

**SUBSTITUTE FOR LINK MOTION.**—The master mechanic of the Midland railroad shops at Norwich, Conn., is reported to have invented a substitute for the "link motion," which employs but one eccentric, and accomplishes all which that famous method of working valves does without its complication, and with the expenditure of less power. The link motion is in itself so perfect, so simple and so admirably adapted to the uses to which it is put, whether upon the locomotive or marine engine, that it is almost impossible to credit the statement in regard to this invention. Although so nearly perfect, the link motion is still susceptible of very material improvement, and it is quite probable that in time it may be greatly modified with advantage.

## SCIENTIFIC PROGRESS.

## The Value of Science to Artisans.

At the annual meeting of the Birmingham and Midland Institute, England, the chairman, Mr. J. Thackeray Bunce, in the course of his address spoke at some length on what we may term the commercial value of scientific knowledge, or on the value of that kind of information to those engaged in manufactures and industrial pursuits of all kinds. We quote the following eminently true paragraphs: "By a study of science at this time, we do not mean study in its highest and best sense, a search after knowledge for its own sake, but that amount of study which is undertaken for the advantage it gives in competition with other manufacturers or professionals, and with other nations. As a nation we must be workers, producers; we cannot afford to wander about the by-ways of learning for the mere pleasure of gaining knowledge; we must, or the great majority of us must, tread the broad roads already graded and laid out by previous workers, picking up all the information we can, and storing it in orderly fashion in our mental wallets for use by and for. Others among us—a gradually increasing number—will strike out paths for themselves across untrodden fields, and seek for new treasures with more or less success. We cannot all make researches and experiments, nor are we all fitted for the work; but we can all learn something of what is known already, and so prepare ourselves to take advantage of and utilize the discoveries of scientific investigators."

Every artisan in the kingdom can, if he will, make himself acquainted with the principles on which the practices with which he is familiar are based, and there is no industry in the country which would not be benefited by such knowledge on the part of its workers. In a few years now a considerable portion of our workers will be men who are more or less well grounded in theory; they are receiving a technical education, and when they enter the ranks of the industrial army they must, in the natural order of things, occupy prominent places. Even now Whitworth's scholars, at present a comparatively small number, make their way readily to the front, and in competition with mere rule-of-thumb men gain an easy victory.

## Optical Characters of Minerals.

A new method of studying characters of minerals was lately described by Mr. Sorby, F. R. S., in a paper read before the British Association. The author first described the principles on which the method depended, and that the great difference between the appearance seen with the naked eye and the microscopists due to the object glass being able to collect divergent rays. In looking with a low magnifying power at a small circular hole seen through a section of a crystal, very different phenomena present themselves, according to its optical characters. If double refraction only one well-defined circular hole can be seen. If the mineral possess double refraction and only one optic axis, like calcite, two images of the hole are seen. If the section be cut perpendicular to the axis, two circular holes are seen directly superimposed, but at two different foci. If the section be in the plane of cleavage, two widely-divided images are visible, the one due to the ordinary ray being circular and the other due to the ordinary ray being distorted and drawn out in two opposite plains at two different foci. When the section is cut parallel to the axis, this image due to the extraordinary ray is still more elongated, but the images are directly superimposed. We thus at once learn that the mineral has double refraction, has an optic axis, and also what is the direction in which the section is cut. In the case of crystals like Arragonite, which have two optic axes, there is no ordinary ray, and at the focal points we see the circular hole is drawn out in opposite planes into crosses. The character of these crosses depends upon the direction of the section, but the fact of the crosses being seen at once proves the mineral has two optic axes. Some facts are better observed if, instead of a circular hole, we examine through the crystalline plate a grating with two systems of lines at right angles to one another. We then obtain what the author calls unifocal or bifocal images, according to the system of crystallization. Crystals with double refraction have only one unifocal image; crystals having one optic axis have one unifocal and bifocal image; whereas crystals having two optic axes give two bifocal images. The definition of unifocal is independent of the position of the lines; whereas in the case of bifocal images the lines are distinctly visible only when they are parallel or perpendicular to a particular axis of the crystal and, spread out, become obscure and disappear when rotated to a different azimuth. The above-named general characters differ so much in different minerals that they furnish a most valuable means for their identification.

**THE EQUATION OF ERROR.**—The *Iron Age* notes that by numerous experiments it has been proved that one who observes and records an occurrence always gives a result which differs from the exact truth. Even where the observer has been trained and skilled in observing events like those in the most accurate experiments, the rule is the same. He records the time too early or too late. The error appears in each experi-

ment, and always to the same amount. If the record was too late in one, it invariably was too late. This habitual difference between the time as noted by an observer and the actual time of the happening of the occurrence is what has been termed the absolute personal equation of that observer. It represents the amount of error which he will always make. It has been found to differ with different persons for the same class of events. It also differs in the same persons for events of different classes. The time required to observe and record the happening of a sudden and unexpected spark, for instance, is always greater than that required in the case of the expected appearance of a letter or figure thrown upon a screen. The equation also differs according as the facts are observed by the use of one of the senses or another. The time required for some of the senses to convey intelligence to us is far greater than that required by others.

**FOOD AND RESPIRATION.**—The *Chemical News* gives an outline of some researches on the consumption of oxygen and the excretion of carbonic acid in man, by Dr. Speck. The author has examined the changes produced in the respiratory process by the use of fatty food, of coffee, quinine, alcohol and water, and by the inspiration of air respectively rich in carbonic acid, poor in oxygen, and rich in oxygen. His chief conclusions are: 1st. With an increased proportion of hydrogen in diet the amount of the air inspired and expired decreases. Nutrients, such as sugar, which contain little hydrogen in comparison with their oxygen, involve more exertion of the respiratory organs than such as are rich in hydrogen, like the fats. 2d. The more carbon predominates in the food in proportion to hydrogen the more air is exhaled in proportion to that inhaled. 3d. The more carbon increases in the diet in proportion to hydrogen, the more carbonic acid is evolved and the more oxygen is taken up; the richer the diet in hydrogen the less oxygen is required. An atmosphere containing five or six per cent. of carbonic acid could be breathed for some minutes without oppression. At 11.51 per cent. great exertion was needed to breathe for one minute. At 7.2 per cent. all the carbonic acid produced in the body is retained in the blood, and 11.2 per cent. a great part of that also which is inhaled.

**IRON OR BONE.**—We read that the town of Hazleton, Pa., has been excited during the past few days by what was, and by some is still, supposed to be portions of a gigantic fossil skeleton of some hitherto unknown monster. A piece shown to Prof. Leslie was decided by that gentleman to be iron ore. Notwithstanding the opinion of so high an authority, there are some who still contend that a veritable skeleton has been discovered. The formation of the pieces that have been preserved are certainly very peculiar, one piece in particular bearing a very striking resemblance to vertebrae, showing joints and protuberances at regular distances, and unlike the most fantastic geological formation ever seen. As Prof. Leslie was obliged to form his opinion from a single piece that had been sent him for examination, it was determined to have the largest and most peculiar parts subjected to a further test. Accordingly, Prof. Prime, of Lafayette college, examined the supposed fossil remains. He was unable to decide what they were, and by his advice they were sent to Philadelphia for the inspection of Prof. Leidy.

**INCOMBUSTIBLE WRITING PAPER.**—Two Spanish gentlemen, of Salamanca, have just obtained a patent in Spain for making writing paper incombustible. A number of experiments have been made with the process, and the results are said to have been very satisfactory. The paper will not burn, no matter what may be the intensity of the heat applied. A single sheet submitted to the direct action of a flame will carbonize, but does not take fire. If a roll of prepared paper is placed in the hottest fire the outside leaves will carbonize and the edges for a short depth, but the interior remains unaltered, the writing or printing being perfectly legible. Its cheapness especially recommends it for public documents, archives, etc., which might be desirable to preserve. Papers already written or printed upon may undergo the process without injury. The patentees expect to make an arrangement with the government to apply the process in the manufacture of the paper used by it for public business, which can be done at a very trifling expense.

**NOTES ON PLANTS.**—The scientific writer for the *Independent* recently noted a remark of *Nature* that a variety "under cultivation" was no guide, and took occasion to say that "cultivation" in the discussion of these biological questions had little meaning. Since that remark the distinguished morphologist, Dr. Maxwell T. Masters, has published a paper on variations in primroses, in which he says that "cultivation" is not the cause of variation in this well-known genus, as he finds variations common among them in a wild state. This, we believe, is the experience of any botanist in any family, as well as in primroses. A singular rhythmic motion has been discovered by Rodier, of Bordeaux, in a water-plant (*Ceratophyllum demersum*). The axis curves to one side and to the other every four hours. It was clearly ascertained that light made no difference in the act. Last year similar motion was noticed in *Liatris*, in our own country, and it may be more common in plants than is generally supposed.



## Table of Highest and Lowest Sales in S. F. Stock Exchange.

Name of Company.	Week Ending Oct. 4.	Week Ending Oct. 11.	Week Ending Oct. 18.	Week Ending Oct. 25.
Alpha.....	14 103	15 113	15 113	15 113
Alta.....	15 113	15 113	15 113	15 113
Andes.....	15 113	15 113	15 113	15 113
Baltimore Co.....	75c 1	1 30c 1	1 20c 1	1 10c 1
Belcher.....	6 64	7 64	6 64	6 64
Belmont.....	20 21	20 21	20 21	20 21
Best & Belcher.....	84 114	114 114	114 114	114 114
Bullion.....	3 40 4 40	4 40 4 40	4 40 4 40	4 40 4 40
Caledonia.....	30 31	31 31	31 31	31 31
California.....	30 31	31 31	31 31	31 31
Challenger.....	33 36	36 36	36 36	36 36
Chollar.....	33 36	36 36	36 36	36 36
Confidence.....	5 51	7 61	6 61	6 61
Con Imperial.....	95c 1 30	1 30 1 30	1 30 1 30	1 30 1 30
Con Virginia.....	95c 1 30	1 30 1 30	1 30 1 30	1 30 1 30
Crown Point.....	95c 1 30	1 30 1 30	1 30 1 30	1 30 1 30
Coso Con.....	15c 10c	15c 10c	15c 10c	15c 10c
Dayton.....	50c 75c	90c 60c	1 50c 90c	55c 90c
Eureka Co.....	45 47 47	45 47 47	45 47 47	45 47 47
Exchequer.....	49 14	13 11	11 10	11 10
Geddes & Bortman.....	25c	25c	25c	25c
Gen Thomas.....	17 19	20 20	17 20	13 19
Gila.....	1 1 70	1 70 1 20	1 40 1 1	1 95 1 40
Golden Chariot.....	75c 90c	75c 90c	75c 90c	75c 90c
Gould & Curry.....	91 101	12 101	11 101	11 101
Hale & Norcross.....	6 71	7 71	7 71	7 71
Hasey & Norcross.....	40c 45c	75c 45c	75c 45c	75c 45c
Justice.....	14 17	15 14	14 12	14 12
Jackson.....	8 10	9 7	8 7	8 7
Kentuck.....	3 3	3 3	3 3	3 3
Knickerbocker.....	25c 50c	50c 30c	45c 35c	25c 35c
Kossuth.....	25c 50c	50c 30c	45c 35c	25c 35c
Lady Bryan.....	21 31	31 31	31 31	31 31
Lady Wash.....	21 31	31 31	31 31	31 31
Leopard.....	20c 30c	25c 25c	55c 60c	55c 60c
Leviathan.....	2 20 2 30	2 21	2 60 3 05	2 60 3 05
Leeds.....	1 1 60	1 35	1 1 35	1 85 1 30
Manhattan.....	50c 55c	50c 50c	40c 50c	40c 50c
Meadow Valley.....	20c 40c	50c 40c	40c 40c	40c 50c
Mexican.....	10 11 11	11 11	11 11	11 11
North Con Virginia.....	50c 75c	60c 55c	75c 55c	50c 50c
New York.....	50c 1 05	90c 55c	55c 55c	55c 55c
Niagara.....	1 40 1 40	1 40 1 40	1 40 1 40	1 40 1 40
Northern Belle.....	20 21	20 19	17 19	15 19
New Coso.....	75c 1 40	1 15 1 1	1 70c 1 10	75c 1 10
Occidental.....	1 2	1 2	1 2	1 2
Ophir.....	10 12	12 12	17 13	11 11
Overman.....	23 25	25 25	25 25	25 19
Pacific.....	75c 1	1 11	1 10	70c 1
Phil Sheridan.....	70c 1	1 11	1 10	70c 1
Pioneer.....	10c 20c	50c 10c	45c 55c	50c 50c
Prospect.....	71 12	11 10	10 9	10 9
Raymond & Ely.....	25c 45c	40c 30c	25c 15c	30c 20c
Rock Island.....	71 71	71 71	71 71	71 71
Savage.....	4 61	4 61	4 61	4 61
Seg Belcher.....	4 61	4 61	4 61	4 61
Sierra Nevada.....	4 61	4 61	4 61	4 61
Silver Hill.....	4 61	4 61	4 61	4 61
South Chariot.....	2 40	3 55	3 45	3 40
Succor.....	90c 70	2 1 60	1 85 1 35	2 30 2 50
Trojan.....	60 71	8 67	7 67	7 67
Union Con.....	12 13	17 12	13 15	13 15
Utah.....	55c 65c	1 35	1 20	1 05 85c
Wells Fargo.....	55c 65c	1 35	1 20	1 05 85c
Woodville.....	9 99	10 10	10 10	9 9
Yellow Jacket.....	9 99	10 10	10 10	9 9

## Sales at S. F. Stock Exchange.

Friday A. M., Oct. 19.	350 Star.....	41
180 Alpha.....	14 103	15
150 Andes.....	15 113	15
1005 Alta.....	15 113	15
1805 Bullion.....	11 114	12
190 Belcher.....	6 64	7
300 Best & Belcher.....	84 114	114
100 Benton.....	3 40 4 40	4 40
2720 Con Imperial.....	1 10 1 10	1 10
1000 Crown Point.....	6 64	7
190 Chollar.....	33 36	36
635 Chollar.....	33 36	36
700 Con Virginia.....	95c 1 30	1 30
100 Confidence.....	5 51	7
1700 Cherokee.....	2 20 2 30	2 30
275 Dayton.....	70 75	75
700 Exchequer.....	49 14	13
1250 Gould & Curry.....	11 11	11
1525 Hale & Norcross.....	7 71	7
1005 Justice.....	14 17	15
30 Joe Scates.....	95c 1 30	1 30
60 Kentuck.....	3 3	3
120 Lady Wash.....	21 31	31
500 Niagara.....	1 40 1 40	1 40
500 North Con Vir.....	50c 75c	60c
1050 New York.....	50c 1 05	90c
200 Overman.....	23 25	25
100 Occidental.....	1 2	1
270 Ophir.....	10 12	12
290 Prospect.....	50c 50c	50c
1650 Peytona.....	1 10 1 30	1 30
300 Rock Island.....	71 71	71
110 Sierra Nevada.....	4 61	4
50 Senator.....	1 40 1 40	1 40
700 South Justice.....	1 1 70	1 70
620 St Louis.....	30 35	35
475 Succor.....	10 12	12
170 Silver Hill.....	2 30 2 30	2 30
100 Seg Belcher.....	4 61	4
2460 Trojan.....	1 65 1 65	1 65
300 Union Con.....	70 71	71
50 Utah.....	55c 65c	1 35
265 Woodville.....	9 99	10
540 Ward.....	1 1 40	1 40
400 Wells Fargo.....	1 10 1 10	1 10
130 Yellow Jacket.....	9 99	10
AFTERNOON SESSION.		
750 Alta.....	9 99	10
300 Alps.....	2 85 2 90	2 90
100 Argentina.....	2 2 25	2 25
1355 Bodie.....	2 2 25	2 25
125 Bullion.....	11 11	11
5050 Belle Isle.....	70 75	75
130 Best & Belcher.....	84 114	114
500 Combination.....	30 35	35
225 Con Virginia.....	32 32	32
10 Chollar.....	33 36	36
730 Con Imperial.....	1 10 1 10	1 10
1000 Coso Con.....	10 15	15
100 DeFrees.....	1 55 1 55	1 55
230 Day.....	50 50	50
140 Dayton.....	45 47	47
145 Exchequer.....	49 14	14
400 Empiro Idaho.....	1 40 1 40	1 40
200 Eureka Co.....	45 47	47
200 Grand Prize W.....	1 10 1 10	1 10
2350 Gila.....	1 1 90	1 90
70 Gould & Curry.....	11 11	11
170 Husey.....	50 50	50
400 Horner.....	40 40	40
255 Hale & Norcross.....	7 71	7
650 Independent.....	1 30 1 30	1 30
775 Justice.....	13 14	14
1000 Jackson.....	8 10	10
300 Joseph.....	1 30 1 30	1 30
500 Kentuck.....	3 3	3
500 Leeds.....	2 60 2 80	2 80
50 Manhattan.....	11 11	11
1150 Modoc.....	1 1 15	1 15
30 New Coso.....	2 40 2 40	2 40
345 Northern Belle.....	15 15	15
900 Navajo.....	2 40 2 40	2 40
30 Ophir.....	10 10	10
210 Overman.....	25 25	25
120 Raymond & Ely.....	9 99	10
200 Rye Patch.....	4 45	45
385 Savage.....	10 10	10

635 Best & Belcher.....	22 22	22
600 Benton.....	3 40	40
230 Baltimore Con.....	1 05 1 10	1 10
500 Con Virginia.....	95c 1 30	1 30
3005 Con Imperial.....	1 05 1 10	1 10
385 California.....	31 31	31
105 Chollar.....	33 36	36
810 Crown Point.....	6 64	64
35 Confidence.....	5 51	51
305 Caledonia.....	3 35 3 35	3 35
2500 Cherokee.....	2 20	20
1500 Dayton.....	45 47	47
100 Dardanelles.....	1 11 1 11	1 11
900 Exchequer.....	49 14	14
240 Gould & Curry.....	11 11	11
250 Hale & Norcross.....	7 71	71
2050 Julia.....	2 30 2 30	2 30
230 Leeward.....	6 64	64
625 Justice.....	13 14	14
115 Kentuck.....	3 3	3
200 Kossuth.....	25c 50c	50c
400 Lady Wash.....	21 31	31
250 Leviathan.....	1 40 1 40	1 40
450 Mexican.....	11 11	11
500 Niagara.....	1 40 1 40	1 40
570 New York.....	50c 1 05	1 05
230 Oldman.....	1 10 1 10	1 10
160 Ophir.....	10 10	10
650 Peytona.....	1 35 1 35	1 35
320 Savage.....	1 10 1 10	1 10
315 Sierra Nevada.....	4 60 4 60	4 60
500 South Justice.....	1 40 1 40	1 40
215 St Louis.....	30c 30c	30c
255 Silver Hill.....	2 10 2 15	2 15
300 Succor.....	10 10	10
2175 Trojan.....	1 10 1 10	1 10
230 Union Con.....	70 71	71
235 Ward.....	1 10 1 10	1 10
200 Wells Fargo.....	1 10 1 10	1 10
100 Woodville.....	9 99	99
810 Yellow Jacket.....	9 99	99
AFTERNOON SESSION.		
1330 Alta.....	6 64	64
65 Alpha.....	14 103	103
200 Argenta.....	2 15 2 15	2 15
1150 Belle Isle.....	50c 50c	50c
120 Belcher.....	6 64	64
100 Bullion.....	11 11	11
80 Best & Belcher.....	84 114	114
1495 Crown Point.....	6 64	64
400 California.....	31 31	31
170 Caledonia.....	3 35 3 35	3 35
100 Con Imperial.....	1 05 1 10	1 10
700 Coso Con.....	10 15	15
500 Con Virginia.....	32 32	32
550 Day.....	50 50	50
110 DeFrees.....	1 55 1 55	1 55
600 Dayton.....	45 47	47
805 El Dorado S.....	11 11	11
740 Exchequer.....	49 14	14
670 Gila.....	1 10 1 10	1 10
700 Grand Prize.....	1 10 1 10	1 10
100 Golden Chariot.....	25c 25c	25c
790 Gould & Curry.....	11 11	11
400 Husey.....	50 50	50
200 Hale & Norcross.....	7 71	71
800 Hornet.....	40 40	40
2770 Independent.....	1 10 1 10	1 10
300 Jackson.....	10 10	10
1000 Julia.....	2 30 2 30	2 30
300 Leopard.....	1 10 1 10	1 10
200 Leeds.....	2 15 2 15	2 15
300 Modoc.....	1 15 1 15	1 15
300 Manhattan.....	11 11	11
500 Mansfield.....	25c 25c	25c
55 Meadow Valley.....	40 40	40
205 Mexican.....	11 11	11
1800 Navajo.....	2 40 2 40	2 40
725 Northern Belle.....	15 15	15
30 Ophir.....	10 10	10
185 Overman.....	25 25	25
185 Raymond & Ely.....	9 99	99
1705 Sierra Nevada.....	4 60 4 60	4 60
1700 Succor.....	10 10	10
500 Savage.....	2 60 2 80	2 80
270 Silver Prize.....	1 10 1 10	1 10
300 Trojan.....	1 10 1 10	1 10
50 Ward.....	1 10 1 10	1 10
205 Mexican.....	11 11	11
1800 Navajo.....	2 40 2 40	2 40
725 Northern Belle.....	15 15	15
30 Ophir.....	10 10	10
185 Overman.....	25 25	25
185 Raymond & Ely.....	9 99	99
1705 Sierra Nevada.....	4 60 4 60	4 60
1700 Succor.....	10 10	10
500 Savage.....	2 60 2 80	2 80
270 Silver Prize.....	1 10 1 10	1 10
300 Trojan.....	1 10 1 10	1 10
50 Ward.....	1 10 1 10	1 10
205 Mexican.....	11 11	11
1800 Navajo.....	2 40 2 40	2 40
725 Northern Belle.....	15 15	15
30 Ophir.....	10 10	10
185 Over		



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## THE ENGINEER.

### Projected Railroads in Japan.

Mr. R. V. Boyle, Engineer-in-chief of the Japanese government railways, has recently made an examination of certain lines believed to be most needed, and reported thereon, dividing the proposed lines into sections, of which he speaks separately. The first section is from Tokio, on the Gulf of Yedo, northwest to Takasaki, 66 miles, passing through Inatsuki, Omiya, Tuiyaka and Okahe. Much of the work on this section would be light, though some large river crossings are needed over the Toda-gawa, and protection of the road-bed against floods in that river would also be necessary. Takasaki is a town of much importance, with a considerable trade, and there is already much traffic along the proposed line, which could probably be much increased by the railroad.

The second section is from Takasaki nearly due west to Matsumoto, 80 miles, and this section will require some heavy work in the hills about Shanani and a tunnel about a mile and a half long at the head of the Shiroya valley. There is much broken and mountainous country along the line, requiring the heaviest grades and sharpest curves for the road, besides for most expensive work. But little local traffic can be looked for, but this section would be of value as a part of the through line and as connecting two populous provinces now separated by a mountainous district, crossed by few roads, and those very poor.

At Matsumoto the line turns sharply to the southward and runs in that direction 70 miles to Nakatsugawa-Yeki. The work on this section will be lighter than on the previous one, though some heavy grading will be needed on the divide between the Sai-Kawa and Kiso-Kawa valleys. For the most part, however, the line follows a natural and comparatively easy route through the river valleys, needing some bridging, but none of very large size. Much local traffic would come to the line, besides a considerable business in lumber, which is floated down the mountain stream.

From Nakatsugawa the road will turn westward and run in that direction 55 miles to Kano and Gifu, following the valleys of the Toki-gawa and Nemoto-gawa, and then crossing a low range of hills, down the Oahri-gawa and Kiso-gawa to Gifu. The grades on this division will be light, and the only expensive bridge needed will be that over the Kiso-gawa, near Doda.

These four sections complete a main line of 271 miles from Tokio to Gifu, and from the latter place a line already surveyed runs southwest 74 miles to Kioto, making a total distance of 345 miles from Tokio to Kioto. At the western end the line would connect with the 49 miles of road now in operation from Kioto to Kohe, and at the eastern with the 18 miles from Tokio to Yokohama. The line marked out connects two principal cities, and follows an already established route of travel and trade, which is believed to be capable of great development.

The last section surveyed forms a branch of this main line from Uyeda and Tanaki north by east to the important sea port of Niigata. This branch will require only a moderate amount of heavy work, though much of it is through a broken and hilly region, and a good many bridges will be needed. There will be little rock work, and most of that is through a light and easily-worked rock. For much of the distance the road follows the Chikuma-gawa, and it will have to meet the competition of boat navigation on that river for nearly 75 miles. Much of the line, however, is through a very rich rice country, from which a large traffic can be carried to the main line.

**THE METRICAL SYSTEM IN ENGINEERING.**—At a meeting of the Liverpool Engineering Society a paper was read by Mr. Dunkinfield Jones, on "The Advantages of the Metrical System in Engineering." After pointing out that the meter is supposed by some to be the ten-millionth part of a quadrant of the earth's meridian, he observed that for all practical purposes it would be just as useful if it were the eleven-millionth part. All that it is necessary to admit is that the meter is a convenient unit of measure, and that its length is equal to the distance between two points on a platinum bar in Paris, and is equal to 39.37079 English inches. The subdivisions are one-tenth part or decimeter, the hundredth or centimeter, and the thousandth or millimeter. He dwelt at some length on the interdependence of the metrical measures of length, capacity and weight, pointing out that the "liter," or cubic decimeter, is the unit of capacity, and the kilogramme the weight of a cubic decimeter of distilled water at the temperature of 4° C., and with the barometric pressure at 760 millimeters. To illustrate the great saving in figures which may be effected in engineering operations by the metrical system, he exhibited two diagrams representing ordinary railway working sections, and stated that the one prepared on the metrical system had nearly 20% less figures than the section prepared with the English measures, notwithstanding that they both represented precisely the same cutting and gave identical information at every point. He concluded his paper by hinting at there being some probabilities of a decimal coinage being introduced even before the metrical system of weights and measures.

### A Bridge for the Bosphorus.

While Turkey is in the throes of a bloody war two American engineers are planning a magnificent public work for her so soon as she returns to peace and peaceful arts. The leader in the plans for bridging the Bosphorus is Capt. Eads, whose fame is in the Mississippi's mouth, and his associate is A. O. Lambert, an experienced bridge builder. They plan a bridge about 6,000 feet long—over a mile. It will have 15 spans and will be 100 feet wide, and, save the masonry and flooring, will be built of iron. The height of the roadway above the surface of the water will be 120 feet, thus affording ample passage ways beneath the arches for ingoing and outgoing ships. It will be observed that this elevation of the bridge above the Bosphorus is some 60 feet less than that of the Brooklyn bridge above the East river, with the difference that the latter is a suspension bridge, while the former will present a series of 15 bold arches thrown over the most attractive waterscape in the world. The greatest feat of engineering will be the bold central arch, 750 feet span—over an eighth of a mile. This is the longest span ever contemplated, and its construction will necessitate the most careful labor and no small outlay of money. In order to accomplish this single portion of the work alone, two caissons will have to be sunk in over 100 feet of water; and this can only be done by cofferdams and special contrivances, in their completeness yet unknown to engineering. The current at the point where these piers will rest is very strong, coming through the Dardanelles from the Sea of Marmora, and rushing to the Black sea. The two central piers, constituting the backbone of the bridge, will be 50 feet thick, of solid granite blocks, locked together with iron braces. A side view of the bridge will present, below the highest points of the arches, an intricate system of reinforce braces. Besides the main span of 750 feet, there will be two spans of 500 feet each adjoining the central one, and the distance between the arches will go on diminishing as the bridge approaches either shore until the arches reach the minimum width of 200 feet.

By an invention of Capt. Eads a new feature will be introduced so that a train of cars, or any other heavy burden will not superimpose its weight at any one point over which it may be at the moment, but will be distributed throughout the 6,000 feet of the supports, thus making it an easy task to build an arch of 750 feet. This is accomplished by uniting all the main bracing from pier-head to pier-head, and connecting the minor rods, so that the whole forms a complete system, making one brace dependent on the other. The action of heavy weights of troops marching to a common step, of rapid locomotion by the cars, is thus instantly communicated through every foot of the supports, and every part is made to do its duty. Perhaps the magnitude of the undertaking may be better understood when it is stated that the main piers will be 270 feet high from the foundation to the summit. It is estimated that the cost of construction will not exceed \$25,000,000, and the time to complete it six years. It took about eight years to build the St. Louis bridge; but in the case of the projected one over the Bosphorus the conditions are very different. Excellent granite can be found in desirable quantities near the place of construction and the labor will be very cheap.

**THE DEEPEST BRIDGE PIERS IN THE WORLD.**—We read in the *Railway World* about a meeting of the directors of the Poughkeepsie Bridge Company, at Poughkeepsie. Before the business meeting the directors went in a tug to investigate the work done. The westerly pier was found to be fixed on the solid gravel bed 97 feet below the surface of the water. The granite is beginning to arrive, and the work of building the stone piers will be begun shortly. The second caisson is sunk 75 feet below the surface. The depth of the mud is greater than with the first pier, so that a foundation will be secured 112 feet below the surface. Both these caissons are immense timber structures, and will be filled with solid concrete to a point 25 feet below the surface, where the granite pier will begin. All the piers for this bridge will be sunk to a depth greater than that of any bridge piers in the world. There are to be four piers in all, and two will be completed to a point 20 feet above the water before the river freezes. The height of the piers above the water is to be 130 feet, and the depth of the truss 60 feet, so that the railroad track will be 190 feet above the water line.

**UNDERGROUND TELEGRAPH WIRES.**—We learn from an English exchange that a considerable mileage of overground telegraph in the United Kingdom has been replaced by underground wires during the past year. At the time of the transfer of the telegraphs to the post office, the total length of underground wire in existence was a trifle under 2,000 miles. On the 31st of March last it had been increased to a trifle over 3,000 miles, being more than four times as much in 1877 as in 1870. A considerable proportion of the increase in the mileage of buried telegraphs during the year has been in London alone. The aerial system was fraught with danger to life and property in the neighborhood of the wires. Under the new arrangement the telegraphic system generally will be less liable to interruption when the frosts and snows of winter set in.

### Arizona's Mineral Resources.

The *Arizona Miner* says: The mining news from the various mining camps throughout the Territory is looking up, and the prospect for a big yield in bullion from the few of the many rich mines being developed, seems certain; which will have a tendency to bring emigration to our borders in a greater ratio than at any period since the settlement by Americans. Along the Sonora line on the south, and to the east bordering on New Mexico, in Pima county, reports of rich finds and a healthy outlook is chronicled by the press, prospector and others who are authority from that section. New and improved machinery is taking the place of the old rude arastras, and where one ton of ore could be reduced in 24 hours, now the capacity can be increased to from 15 to 60 tons.

In Pinal county, although the mining enterprises are, as it were, in their infancy, much is being done which goes to show that the deposits of mineral are very valuable. Many new and costly mills are being brought in and erected, some of which are now, with steady and telling effect, pulverizing the glittering ores which are yielding satisfactory profits to their worthy owners.

Following this wonderful belt of mineral northward through the county of Maricopa, which can boast of valuable mining property, besides having the most extensive valley for agricultural purposes in the Territory, we strike the famous mines of Bradshaw, Humbug, Peck and Turkey Creek districts, where the din from the miners' hammer and pick resounds through every canyon and over every hill top. Capital is coming in, cahins are appearing like magic upon the various leads, idle men are being hired and put to work prospecting the mysterious recesses far beneath the cropping that stand like monuments, beckoning the hardy miner on to plunge deep for the great treasures buried in the dark beds of slumber, encased and held secure by the massive walls, rock-ribbed, which were formed by nature in the long past. Quartz mills are numerous throughout the county, and the shipment of bullion will justify us in the assertion that in no country are the mines more valuable than here in Yavapai, and with the completion of the new machinery now being put up, we expect the increase in bullion will exceed anything heretofore chronicled several fold.

To the west, in Mohave county, we have the McCrackin mine, which, in size and richness, surpasses the renowned Comstock of Nevada; and just now two new mills are under construction, which will be used in turning out the glittering bars of silver from this wonderful deposit.

During the next year we look for the population of the Territory to be doubled, and the day is drawing nigh when the State of Arizona will cause another star to be placed on the American flag.

### Mineral Hill.

We interviewed a late arrival from Mineral Hill yesterday, and he informs us that matters are quiet in that village. Supt. Plummer is busy examining the English company's ground, and making ore assays from rock selected from various portions of the mine. It is probable that the property will be prospected by means of diamond drills, the Superintendent boding to the idea that that method furnishes the most effectual and cheapest way of determining the position of the ore bodies supposed to exist in the hidden depths. The mine, as everyone familiar with the locality knows, yielded immensely from the croppings down to a certain depth, but very little system was used and the ground was honeycombed in every direction in search of the valuable deposits. The greatest depth attained was about 200 feet, when operations were suspended on account of dissensions among the English stockholders. Capt. Plummer, by reason of numerous experiments and a careful geological survey, is satisfied that the hill contains many hidden bonanzas. He has communicated his faith to the company he represents, and they have given him full power to proceed with such work as he may consider necessary. The chloriders are very anxious to have the mill start up, and claim that in that event there are hundreds of tons of rock on the hill that can be utilized and worked at a profit, both to the mill and the owners. This same rock is not of high enough grade to pay for shipment, and as a consequence is piled away on the dumps awaiting the commencement of operations at the mill. All the residents are very confident of the future prosperity of the town, and predict good times in the near future.—*Eureka Sentinel*.

**RAILWAY INJURIES AND DEATHS.**—A table of statistics recently published, shows that on English railways the proportion of passengers killed is one to every 17,000,000 carried; number killed or injured, one to every 488,908 carried; number of employees killed one to every 416; number of employees killed or injured, one to every 86. In Massachusetts, the same table shows one passenger killed to every 35,000,000 carried; one killed or injured to every 8,750,000 carried; one employee killed to every 650, and one killed or injured to every 304.

**TO CLEANSE JEWELRY.**—Use hot water and a clean brush; rub a little soap on the brush, then dip it into powdered borax and scour well; rinse in hot water, and rub dry with a clean towel, or chamois is better.

### The Unemployed at Eureka.

The *Sentinel* says: The influx of miners and laboring men to Eureka during the last two weeks has been very large, and as a consequence idle, but industrious men, who would work if they had a chance, abound, and are to be found on all occasions visiting the mines and furnaces in search of a job. We are informed that no less than 50 applications are made daily for work at the Consolidated reduction works, and the Richmond and K. K. have the same experience. At the time of changing shifts at least 20 men congregate at the furnaces in hopes of being put on in place of some absent feeder or slag wheeler. This state of things does not result from any suspension of operations in our mines as it is an undisputed fact that the rolls of the different companies show that a larger force is employed at the present time than at any other period during the year, but rather that Eureka has become the Mecca for all unemployed men in eastern Nevada. Tybo, Hamilton, Ward, and districts south of us are not as prosperous as they were a year ago, and the surplus population of those points naturally migrate Eurekaward, attracted by the stories of our prosperity. Besides the emigration mentioned, we are getting large accessions from Tuscarora, many of the surplus who are disappointed in obtaining employment, floating over this way. There is no speedy prospect of any much larger force being put to work this winter, as the products of the mines are limited to a certain extent, by the reduction capacity of the furnaces. The Eureka dumps are piled to overflowing and the four smelters are crowded with ore. The Richmond company are employing a sufficient force at the present time to more than supply their works. The same may be said of all the others in the district, with the exception of the Metamoras, which latter, will, on the completion of their new furnace, put on an increased force both at the mine and works. In view of the above facts, we advise all those in search of employment, who contemplate visiting this town, to seek some other locality as they will find every place already filled, and no opening existing.

### Water Freaks in Mines.

The *Virginia Enterprise* of the 14th inst. says: A few days since notice was made of the receding of the water in the flooded mines of some five feet in a single day, and that, too, without any help from the outside world. Singular as was this freak it has been more than equaled recently by operations in the Baltimore Con. Of late steam has been got up there with the intention of freeing the mine from water, preparatory to the resumption of prospecting. When the pumps were started, Superintendent Strother was surprised to find the water but 60 feet above the 1050-foot level. There is considerable water flowing from the 750-foot level of the mine, and, as the pumps had been stopped five months, he expected to find the water above that level. After the water had been lowered to the 1050-foot level, one evening the pumps on that level were attached. The capacity of the pumps is not great, as they are but nine-inch, but in five hours the water was found to have gone down 85 feet, and in its sinking away it had drained about 3,000 feet of drifts on the 1050-foot level. That the pumps should have lifted this water out is simply preposterous. Where could it have gone to? The Baltimore Con. is the deepest mine in American Flat, and the only one there working. The nearest place of corresponding depth is the Caledonia. There is no known connection between the two. The only explanation advanced is that the mine, wherever the water went to, was drained as the heads of intermittent springs and by the eiphon process. But even that is completely upset by the simple question: "Why did it not flow out sooner?" In fact, like some of the ways of the water in the flooded mines, it is simply past finding out.

**THE SONOMA MINES.**—The mines recently discovered in the Sonoma mountains, south of Guthrie's ranch, by Ulrich and Cook, and heretofore alluded to in these columns, are proving to be extensive and valuable. One of the ledges, named the Richard, which is now being prospected by the discoverers, is represented as being from 12 to 18 feet wide. We were shown last evening a certificate of assay of ore from this lead, which showed it to contain \$7.99 in gold and \$92.30 in silver per ton. If the lead contains much ore of this character a mining excitement in this vicinity will shortly be in order.—*Silver State*.

**THE ESMERALDA MINES.**—That the Aurora mines are looming up grandly it is only necessary to say that Lucky Baldwin, Boh Graves, Mackay, Fair, Ralston, D. O. Mills, M. Y. Yerington and others have the principal mines in their hands, and are now preparing to sink shafts 1,000 feet deep in the Del Norte, Juniata and other prominent mines in that section. The best mining experts have given it as their opinion that before another year Aurora will arise to all its pristine glory. Capital is needed everywhere in mining operations, and that the Aurora folks have now secured.—*Eureka Republican*.

The temperature of the water in the header of the Suto tunnel, 18,006 feet from its mouth, is 94°; that of the water in the flooded mines, at the depth of 1,900 feet, is 157°. However, the water in the mines was tapped at a depth of over 2,000.



**"Bobbing" for Quicksilver and Amalgam.**

A pair of industrious and ingenious Germans have hit upon a novel method of mining which is said to be paying them exceedingly well—just how well nobody but themselves know. The Virginia *Enterprise* says they are operating in the bed of the Carson river, some distance above the town of Dayton. Each man is provided with a half-inch iron rod about ten feet in length. At the upper end the rod is so bent as to form a loop or eye large enough to admit the hand, while at the lower end is a copper head about a foot in length, shaped like the head of a soldering iron and weighing some ten pounds. This head has quite a large octagonal bulge in the middle, and in each of its eight faces is a cavity about an inch in depth and nearly three-quarters of an inch in diameter at the top, forming a sort of tapering cup—the cavity being hardly half an inch in diameter at the bottom.

Thus it will be seen that in the head of each probe or "bob" are eight small cup-like cavities. The lower part of the head is drawn out to a tolerably sharp point, and at the upper part also tapers to where it is inserted into and riveted fast in the end of the iron rod. In using the tool the head is first coated in every part with quicksilver, that it may the more readily catch and hold any particles of quicksilver or amalgam with which it comes in contact.

In working the men go to the bed of the river, where there is now very little water, and selecting a place where the amalgam and quicksilver would be likely to lodge, as on the lower sides of boulders and at points where there are sharp curves in the river, they work their probes down into the sand, mud or gravel, as the case may be, and then begin churning. As they thus churn the quicksilver moves toward and into the hole, and either sticks to the sides of the "bob" or is caught in the small cavities we have described.

The "bob" is frequently lifted from the hole and cleaned of the amalgam it has accumulated by means of a small scraper. The cavities are more for use in catching the quicksilver that flows in at the sides of the holes when the ground is shaken than for collecting amalgam. As is known to all old California miners who have ever used a silvered spoon in cravering, the amalgam is of a clinging nature and is readily lifted out of a hole or crevice by means of a piece of silver or copper that has been quicksilvered. This being the case, any amalgam that may be in the bottom of a hole is lifted out on the point of the "bob." Much quicksilver may also be lifted out on the point of the tool by frequently wiping it.

As the river is lower than ever before known, the men are able to work almost anywhere, wearing gun boots reaching but half way up their legs. In "bobbing" they often work down half a dozen holes within a space little over a yard square. This is in places found to be rich. Often after sinking the first, or "prospect" hole, they leave and hunt a new spot—one that will pay for working.

As there are many hundreds of tons of quicksilver in the bed of the river, all of which contains more or less gold and silver, the two "bobbere" are doubtless making excellent wages. Their tools cost little, as they use nothing but the peculiarly constructed probes we have described, and they are at little expense for living, as they camp on the river and do their own cooking.

The work is tolerably hard when closely followed up, as some of the holes made are nearly ten feet in depth, and when a paying spot is found the tool must be very frequently lifted out and cleaned of the quicksilver and amalgam it has caught.

The men have been at work but little over two weeks, yet they say they have ascertained that there are tricks in the trade well worth knowing. The principal of these is that of having become acquainted with the kind of places in which the amalgam and quicksilver are likely to lodge and form paying deposits. Once they know these places they say they can work them even though there should be a considerable volume of water in the river, therefore they have marked and claim a number of the best spots found.

**UP AND DOWN.**—When stocks are all moving up those who have invested have a mighty high opinion of their judgment in stock matters, but when they begin to tumble every man who has invested begins to kick himself for being the biggest dunderhead on the Pacific coast. Another thing, too, is observable in this business of speculating in stocks, which is the manner in which a man who has stumbled into luck regards such as are losing instead of making money—he looks upon them as the greatest asses in the world—men to whom all opportunity would be useless—men who would not have wit enough to pick up golden eggs were they owners of a goose that laid them. In order that they may neither be pitied nor thought fools, we find a great many men who have always sold out just before a tumble in prices—they keep the fox tucked close within their shirts, swearing they let him go a week before, though he is still going for their lives.—*Enterprise*.

When the Idaho mine of Grass Valley pays its 101st dividend on the 1st Monday in January, there will be a celebration of the occurrence, a somewhat rare one anywhere.

The Black Diamond Coal Company shipped 8,000 tons during the month of August, and 6,000 tons in September.

**USEFUL INFORMATION.****How to Escape from a Burning House.**

People who act with the greatest presence of mind in cases of danger or in accident are almost invariably those who have been thought upon such matters and know beforehand just what to do. The knowledge of the proper method of action in case of danger is probably the best possible method of making a man brave and calm, and for want of this knowledge many lives are annually lost.

The Royal Society for the Protection of Life from Fire has published its directions to its subscribers, and some suggestions for others who may be at fires in London, the following of which are applicable in any city. These living in towns and villages will find the hints valuable:

"Every household should make each person in his house acquainted with the best means of escape, whether the fire breaks out at the top or at the bottom.

"Inmates at the first alarm should endeavor calmly to reflect what means of escape there are in the house. If in bed at the time, wrap themselves in a blanket or bedside carpet; open neither windows nor doors more than necessary; shut every door after them. [This is most important to observe.]

"In the midst of smoke it is comparatively clear toward the ground, consequently progress through smoke can be made on the hands and knees. A silk handkerchief, worsted stocking or other flannel substance, wetted and drawn over the face, permits free breathing and excludes to a great extent the smoke from the lungs. A wet sponge is alike efficacious.

"In the event of being unable to escape either by the street door or the roof, the persons in danger should immediately make their way to the front room window, taking care to close the door after them, and those who have charge of the household should ascertain that every individual is there assembled.

"Persons thus circumstanced are entreated not to precipitate themselves from the window while there remains the least possibility of assistance, and even in the last extremity a plain rope is invaluable, or resource may be had to joining sheets or blankets together, fastening one end to the bedpost or other furniture. This will enable one person to lower all the others separately, and the last may let himself down with comparatively little risk. Select a window over the doorway rather than over the area.

"Do not give vent to the fire by breaking into the house unnecessarily from without, or if an inmate, by opening the doors or windows. Make a point of shutting every door after you as you go through the house. For this purpose doors enclosing the staircase are very useful.

"Upon discovering yourself on fire, reflect that your greatest danger arises from draft to the flames and from their rising upward. Throw yourself on the ground and roll over on the flame—if possible on the rug or loose druggery that drag under you. The table cover, a man's coat, anything of the kind at hand, will serve your purpose. Scream for assistance, ring the bell, but do not run out of the room or remain in an upright position.

"Persons especially exposed to the risk of their dresses taking fire should adopt the precaution of having all linen and cotton washed in a weak solution of chloride of zinc, alum or tungstate of soda."

**Softening Water on a Large Scale.**

There was a paper read before the Mechanical Science Section of the British Association at Plymouth, England, by Mr. F. J. Bramwell, F. R. S., on a new mode of softening water, as carried out at the new lunatic asylum for the county of Middlesex, situated on Banstead Downs, Surrey. The water was pure spring water, obtained from a deep well in the chalk. This water was about 17° of hardness, and was therefore a perfectly fit water for dietetic purposes in its natural condition, but on being boiled it deposited the carbonate of lime in the boilers and pipes through which it was conveyed, and thus the author of the paper was led to urge upon the magistrates the necessity, if they wished to preserve their boilers and heating apparatus from being coated with carbonate of lime, of softening the water by Dr. Clark's process. This process is known to many as an extremely beautiful and simple one. The hardness of chalk waters depends principally upon their containing a certain amount of bicarbonate of lime in solution. Lime is soluble in water readily, bicarbonate of lime is soluble in water readily, but carbonate of lime is insoluble. If, therefore, the bicarbonate could be converted into a carbonate it would be deposited from the water, which would thus become soft. This conversion of the bicarbonate into a carbonate is effected in Clark's process by mixing with the natural water containing the bicarbonate a small portion, one-tenth to an eighth, of water in which lime has been dissolved. On these waters being united they instantly become milky, and after being allowed to stand for some hours the water again becomes bright, the carbonate of lime having fallen to the bottom. This operation, however, it will be seen, requires very large depositing tanks and a considerable expense, therefore, in plant, but Mr. Porter has recently invented an improvement upon Clark's process which appears to promise excellent results, and it has, after experiment, been adopted at Banstead. The principle and

mode of treatment, as far as the chemistry is concerned, are precisely the same as Dr. Clark's, but instead of waiting the slow process of deposition to separate the carbonate of lime from the water, the mixed water is passed through filter presses of a peculiar construction, wherein the very carbonate of lime itself is made the filtering medium for itself, and in this manner, within a quarter of an hour of the mixture having been made, perfectly pure and soft water issued forth. There are four presses at Banstead, and these are sufficient to filter an average hourly quantity of 60,000 gallons of the purest and softest water.

**A ROYAL CAR.**—From the *Wellington Republican* we take the following: The Jackson & Sharp Company, have just finished a narrow-gauge railroad car for King Oscar of Norway and Sweden, which for beauty and convenience is unequaled even by the one recently built by the same firm for Dom Pedro of Brazil, and exhibited at the Centennial. The car is built low to suit the numerous tunnels which occur among the mountain cliffs for which that country is noted, and is divided into three compartments. The smaller compartment is used for a toilet room and also contains the heating apparatus. It is elaborately finished, and furnished with every convenience which would contribute to the hygienic requirements and comfort of the royal family.

At the opposite end of the car is a large compartment for the king and his suite. It is finished in princely style with chairs upholstered with plush. The middle and large compartment is the parlor and royal rooms, furnished with sofas, chairs, lounges and very finely finished tables. The upholstery is of sage green silk tapestry, and is undoubtedly among the finest specimens of workmanship ever sent out from this city. The woods of which the interior is finished are maple, walnut and satinwood veneering, to which a very brilliant polish is imparted by the most skillful artisans. The violet predominates in the various shades in which the ceiling is finished, and is in perfect harmony with the velvety brussels which covers the floor.

**ANOTHER GRINDSTONE BURST.**—On Monday morning, Joseph Webster, a grinder, in the employ of the Bowling Iron Company, was engaged in grinding tools, when the grindstone—which was about seven feet in diameter, and weighed between four and five tons—broke into several pieces. The stone was turning at high speed, and the pieces flew in every direction. One of the pieces struck Webster in the face, killing him instantaneously; and John Thackeray was hit on the leg, and had to leave his work. Webster was sadly disfigured. He was a married man, but has left no family. The windows of the building were broken, and it was otherwise damaged.—*English Paper*.

**TO DETECT ADULTERATION IN VINEGAR.**—Procure ten cents worth of chloride of barium, dissolve it in pure water and add 20 drops to a wine glassful of vinegar. If the vinegar is free from sulphuric acid it will cause no change in its appearance, but if not it will become milky in color, and if allowed to stand will precipitate a sediment resembling lime. Two-thirds of the vinegar sold is thus adulterated, and its effects are very injurious. No one should neglect to use this simple test.

**GOOD HEALTH.****Ventilation and Draught.**

A writer in the *Popular Science Monthly* gives some definitions of ventilation and draught which all should bear in mind: Ventilation is the necessary change of air in a closed space, at which the velocity of the air is still taken for a complete stillness, and motion takes place all around our body. It must not be more than a little above 19 inches per second.

Draught is a one-sided cooling of the body or some part of it, frequently caused by a corresponding motion of the air, but also in other ways, as by increased one-sided radiation. The great danger is, in the first instance, the local perturbation in our heat economy, which has partly local consequences, but also and chiefly disorders the nerves, acting on the caliber of our blood vessels, our vaso-motor nerves which have to regulate the outflow of our heat. When we are in the open air, and the air is in more motion than the air of a draught, we speak of wind, etc., but seldom of draught, because the whole air current flows equally all around us, just as in a well-ventilated room, only with greater velocity.

The vaso-motor nerves, regulating the circulation in our skin, are beyond our control, and we cannot bid them to defend us simply at the place attacked by the draught. They know only how to serve our heat economy when the outflow of heat from our bodies is equal, or nearly so, on all sides. They mistake the local irritation for one spread over the whole surface, and act at once on this error. If one perspires and goes to the window with bare neck or chest, one feels a shiver not only there but all over the body, and the perspiration becomes suppressed accordingly. The blood, which at the time filled the blood vessels of the glowing skin, is displaced by the contraction of its channels, but by the misunderstanding of the vaso-motor nerves it is driven not only from the exposed parts but from the whole surface toward the internal parts. A draught, then, is injurious

only so far as it causes perturbations in our heat economy; and as these perturbations can be caused in different ways we often accuse the draught wrongfully.

**Permanganate as a Disinfectant.**

In its series on various disinfectants, to which we have made reference before, the *Polytechnic Review* alludes to the special uses of permanganate of potassa. It sums up its virtues and usefulness as follows: When small quantities of contagious matters are to be dealt with, it cannot be surpassed, either in the rapidity or thoroughness of action. When, however, large masses of organic refuse, fecal matters and the like must be treated, it is quite inadequate for the purpose, inasmuch as the available oxygen it contains will be quickly seized upon and exhausted by the excessive quantities of readily oxidizable substances therein, so that unless an enormous quantity of the salt were used its employment would be practically of no avail; and neither the ammoniacal odors, nor these of the offensive sulphuretted hydrogen would be fixed, unless large quantities of the mineral acids were employed in conjunction with it, a plan that is open to serious objection. The high price of the permanganate again would operate as a serious obstacle against such wholesale use, even were it not open to the objection of inutilty. As a chemical disinfectant (deodorizer), therefore, the permanganate is not to be recommended. When, however, small quantities of offensive or contagious matters are to be treated by direct contact, as wells of drinking water, or the walls, floors or furniture of ships, hospitals, sick rooms and the like, the application of the permanganate will be found very advantageous, inasmuch as it combines with an energetic action a total freedom—in virtue of its want of volatility—from the strong and, to many persons, disagreeable odor, which renders the use of the cheaper chloride of lime, and to a great degree of carbolic acid objectionable.

**THE DANGER IN ANILINE DYES.**—The *Medical Examiner* concludes that recent experiments have now, beyond doubt, established that aniline dyes, at least the reds and blues, are, in their pure condition, comparatively inert, and that the ill effects which have sometimes been attributed to the use of these dyes are traceable, not to the pure coloring matters themselves, but to traces of arsenic which they contained, and which arose from inefficient purification subsequent to manufacture. Enterprising scientists may always be found who are willing to become martyrs, for science or for notoriety, and the present inquiry has had its self-sacrificing hero in the form of Herr Seidler, of Riga, who administered to himself three-quarters of a grain of aniline red every morning for a period of five weeks, without any ill effects. When it is pointed out that a single grain of aniline red is said to be sufficient to impart a good pink color to fifteen gallons of alcohol, it would be necessary to drink an enormous quantity of artificially colored wine in order to equal a single morning performance of Herr Seidler. So far the question is practically settled, the only remaining difficulty being our inability to ascertain whether pure or impure coloring material has been used in any purchased article; and it will therefore be better, as a simple matter of precaution, to be on our guard against the indiscriminate use of aniline dyes for coloring purposes.

**CURE OF CORNS.**—Soak the foot in warm water for about a quarter of an hour, every night; after each soaking, rub on the corn patiently, with the finger, half a dozen drops of sweet oil, wear around the toe during the day two thicknesses of buckskin, with a hole in it to receive the corn; continue this treatment until the corn falls out; and by wearing moderately loose shoes, it will be months, and even years, before the corn returns, when the same treatment will be efficient in a few days. Paring corns is always dangerous, besides making them take deeper root—as will a weed, if cut off near the ground. Many applications are recommended to be made to corns, to burn or eat out, or soften them, but the plan advised above, by *Hall's Journal of Health*, is safe, is painless, gives most welcome relief in a few hours, and prevents a return of the corn for a longer time than any other remedy; and last of all, it costs nothing but a little attention; that, however, is the great drawback.

**FASTING.**—There are a few bodily ailments, says *Hall's Journal*, which are aggravated, and in some cases rendered incurable by insufficient diet; but with the exception of diphtheria and a few others, nine out of ten of all ordinary ailments are controlled, are arrested or permanently cured by a wise diminution of the amount of food eaten. This is particularly the case when there is no decided ailment, but a general feeling of discomfort or of unwellness. In all actively inflammatory maladies, where there is acute pain anywhere, total abstinence from all substantial food, from everything liquid or solid, except hot teas, is the sheet-anchor of safety, when not extended beyond 36 hours. No one should venture on a longer abstinence on any occasion without the advice of a physician.

**SPECKS BEFORE THE EYES.**—Cease to trouble yourself about the specks and you will probably fail to see them, especially if you find something to do and do it, keeping yourself in as good health as you can.







To these may be added the principal tunnels driven in the mining district of Smartsville:

Name of Tunnel.	Locality.	Length of Tunnel.	Average Grade of Tunnel.	
			Inches per Suica.	Feet per 100.
Babb.....	Thibuctoo.....	1,200	5 1/2	12 3/8
Pactolus.....	"	1,700	6	12 4/10
Bosses Bar.....	"	1,600	6	12 4/10
Blue Gravel.....	Succor Flat.....	1,100	6 1/2	12 4/5
Pittsburg.....	"	900	6	12 4/10
Blue Point.....	"	2,250	6	12 4/10
Enterprise.....	"	1,200	6	12 4/10
Deer Creek.....	Mooney Flat.....	2,200	5	12 3/4

In the locating of drainage tunnels, or in the opening of hydraulic claims which do not require tunnels, that place is to be selected from which the sluices, running on the straightest line, with a given grade, can bottom the major part of the "pay deposit" at the smallest possible expense.

In the establishment of this line, due regard should be had for the dump, and allowance made for contingencies arising from changes, such as depressions and holes in the bedrock. It is advisable, besides allowing for grade and dump, to run the tunnel or cut from a point sufficiently deep to strike from 50 to 75 feet below the top of the bedrock at the point where connection is to be made with the surface.

This additional depth is a matter of judgment, and in determining it one should be governed by the character of the bedrock, extent of ground to be worked, and the position of the shaft. It is always an easy matter to case up the grade, but if the main line of drainage is once fixed, and proves to be too high, it is a source of endless expense, and is frequently fatal to the enterprise.

At the Pioneer mine, Grass Flat, Plumas county, the original owners in opening their claim ran a tunnel 4,000 feet long. When midway in the channel the tunnel was found to be 22 feet above the bedrock. The sum of \$60,000, expended in this work, was a total loss.

#### The Extension of the Tunnel and the Connection of Its Heading with the Surface.

When a tunnel is used to open a claim it should be driven well into the channel before any connection is made with the surface. The shaft which connects with the heading should be vertical.<sup>†</sup> Its size is to be determined by the requirements of the work, four by four or five by nine feet in the clear, according to circumstances. Whilst raising from the tunnel due precaution should be taken against accidents arising from the rush of water, sand and gravel which is liable to occur when the bottom of a deposit is tapped.

When a shaft five by nine in size is sunk it should be divided into two compartments, one of which will serve as a man-way, and in the event of obstructions arising in the other compartment, this one can be used in removing them. There is some difference of opinion as to the use of vertical shafts; also as to the expediency of making direct connection between the shaft and tunnel. Respecting the former, it may be observed that a vertical shaft, when properly timbered, is the most desirable and most economical to use for opening hydraulic claims. With drops 200 feet no difficulty in working has been experienced. As regards the direct connection of the shaft with the tunnel, where the work is well constructed, no trouble nor set-back will be encountered in adopting this method of mining. Where a tunnel has to be extended beyond the shaft it is sometimes convenient to sink the shaft off to one side of the tunnel, connecting it by means of a short drift. In general where an extension of the tunnel has become necessary, the shaft has been reduced to a drop off of 50 or 60 feet, or bedrock cuts have lowered it to a level, and consequently the tunnel as extended will diverge from the course of the main tunnel. This is especially the case when the main tunnel enters, as is most usual, the channel at an angle to its general course.

#### The Timbering of the Shaft, Etc.

To avoid any accident or trouble, such as might be occasioned by caving of the shaft, it should be strongly timbered and closely lagged, and lined on the inside with two-inch lumber to within, say, eight feet of the surface. This top being the first washed off is used for fall. When in soft rock the shaft should be timbered close with timbers of the requisite size. These timbers are then lined on all four sides with blocks of wood from four to six inches in thickness set on the end of the grain.

The bottom of the shaft can be protected against wear by using pieces of heavy logs or sticks of 12 inches square timber stood on end securely bound together, or it can be paved with heavy stones, but in many cases the bare bedrock only is used. The last 50 to 75 feet of the tunnel which connects with the shaft should be lightened from eight to 12 feet, and at their junction the ground should be securely timbered and protected.

With long tunnels it is advisable to sink a second shaft at a convenient distance from the heading. As a precautionary measure a man is sometimes placed in the tunnel to watch the runnings, and in such cases a second shaft is in-

disposable. Should an accident occur at the main shaft, by its caving or closing up, the second shaft would also afford the necessary facilities for re-opening the work.

#### First Washings Through the Shaft.

When a claim is opened by means of a shaft, the first washings through it should be done with care, and the surface, within a great radius as can be conveniently washed and drawn, should be cleared on all sides, before any descent is made by taking off the top timbers. Attempts to push this preliminary work have frequently caused an overcrowding of the shaft, resulting in its filling up or getting choked by caving. It is, therefore, essential that the gravel should be run so as to avoid the rush of material from caves; and to prevent the accumulation of rocks in the bottom of the shaft an excess of water should always be used.

#### The Grade.

The facility with which gravel can be moved by water depends mainly on the inclination which can be given to the sluices. The question of grade is, therefore, one of vital importance, and to carefully investigate and determine this question great care and skill are often required.

When the topography of the country admits of unlimited fall, the grade or incline upon which the sluices are set should be regulated by the character of the gravel to be moved. Where the wash is coarse and cemented, requiring blasting, or where there is much pipe-clay, a heavy grade is requisite. Strongly cemented gravel requires falls or drops to break it up. To

of the box is slightly raised, in order to cause a more general distribution of the materials over the riffles.

Sluices are made of 1 1/2 inch plank, tongued and grooved, resting on sills 4x6 inches. To securely tighten the bottom of the sluices, the planks should be grooved and then joined together by driving in a soft pine tongue. The posts are 4x3 inch scantling. The size of the sluice is regulated by the grade, character of the gravel, and quantity of water to be used. A sluice 6 feet wide and 36 inches deep, on a four or five per cent. grade, will suffice for running 3,000 to 3,500 miner's inches of water. One 4 feet wide, 36 inches deep, on a 4-inch grade to 16-foot boxes, will suffice for 1,200 to 1,500 inches of water, and on a four per cent. grade it is large enough for 2,000 inches. A sluice 3 feet wide and 30 inches deep, with a 1 1/2% grade is ample for 1,000 to 1,200 inches.

The requisite length of the sluice is determined by the character of the gravel to be washed, volume of water used, grade and size of sluices, the principle being to construct the line sufficiently long to insure the most complete disintegration of the gravel, thus affording ample surface for the grinding of the cement, and offering under such conditions the best facilities for the gold to settle in the riffles.

\* Double sluices are frequently used in large claims to advantage for continuous washings.

† Miner's inch, see further on in this article.

THE TIMBER LAND BILL.—Following is the full text of the timber land bill introduced in



Fig. 1. VENTILATION OF MINES.

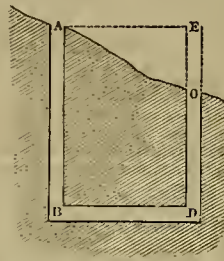


Fig. 2.

prevent the loss of gold, grizzlies\* and undercurrents are used to relieve the sluices of the finer material containing gold already detached and being carried forward by a strong stream and heavy grade.

Experience so far has led to the adoption, in most localities, of what is called a six-inch grade, meaning six inches to the box 12 feet long, or say four per cent. grade. In some places, where large quantities of pipe-clay are washed off, nine and twelve inch grades to the box is used (six to eight per cent.); in others, on account of natural obstacles encountered, a 1 1/2% grade, or 2 1/2 to 3 inches per box of 16 feet is used.

Light gravel can be moved on an easier grade and with less water than heavy gravel, nevertheless, when a four per cent. grade can be ob-

the Senate by Chaffee, and now before the Public Lands Committee:

Be it enacted, etc., that all citizens of the United States, and other persons, bona fide residents of the States of Colorado or Nevada, or of the Territories of New Mexico, Arizona, Utah, Wyoming, Dakota, Idaho, Washington or Montana, shall be and are hereby authorized and permitted to fell and remove for building, agricultural, mining or other domestic purposes, any timber or other trees growing or being on the public lands, said lands being mineral and not subject to entry under the existing laws of the United States in either of said States or Territories, of which such citizens or persons may be at any time bona fide residents, and that Section 2461 of the Revised Statutes of the United States, and all



STEINHAEUSER'S FOLDING ANKLE BOOTS.

tained it is desirable, as it lessens the labor of handling rocks. Moreover, as light gravel is generally poor in gold, this deficiency can only be made up by washing large quantities of it. On the other hand, coarse gravel demands from four to seven per cent. grades, and a proportionate increase of water.

In washing heavy gravel, the water in the sluices should be deep enough (10 to 12 inches) to cover the largest boulders ordinarily sent down, whilst light gravel requires the water to run in sufficient force to carry the rocks washed through the sluice, and yet be in only sufficient volume to prevent the packing of black and heavy sand. If too much water is used, by superincumbent pressure the sand drops and packs the riffles. The best results are obtained with shallow streams on light grades.

#### Setting Sluices and their Construction.

In setting sluices, a straight line should be adopted, and where curves occur, the outer side

\* "Grizzly" where a drop-off can be made in a line of sluices, steel bars or pieces of railroad iron laid parallel, with spaces between them, are placed on the bottom across and in the end of the sluice, so as to discharge the boulders over an embankment, whilst allowing the finer material to pass between the bars and drop into the undercurrents. The grating formed by the bars is called a grizzly. "Undercurrents" are sluices, 15 to 20 feet wide and 40 to 50 feet long, set on a very slight grade (nearly flat) provided with riffles to catch the gold and amalgam. They are placed to one side, below the main sluice. See chapter by Chas. Waldeyer, *Raymond's Report*, 1873, pp. 415, 416.

† In Placer county, at some of the mines, the sluices have a grade from 15 to 24 inches per 12-foot box. Note.—Oro Consolidated, sluices 24 feet wide and 20 inches deep, grade 5 inches to 12 feet (or 10.41%), are calculated to run 700 miner's inches of water.

#### Mine Ventilation.

The following points on mine ventilation are taken from a lecture by Prof. Smythe, delivered at the Royal School of Mines, London:

It is found that a great number of mines are sufficiently ventilated by natural, or "spontaneous" ventilation. For instance, in driving a level to a distance usually of 50 to 80 fathoms, though occasionally as far as 150 fathoms, a natural ventilation will be set up, the air coming into the level along the floor, running as far as the end, then rising and returning along the roof. Similarly in sinking a shaft, especially if there be a little water trickling down the sides, it will be found that the air comes from the surface down the sides of the shaft, and returns up the center, and this natural ventilation is maintained to a greater or less depth. In both cases the natural ventilation is greatly assisted by the placing of a diaphragm, or brattice, horizontally in the case of the level, and vertically in the case of the shaft, so that the currents of air moving in opposite directions are prevented from rubbing against each other.

The same may be observed if there are two levels side by side, with occasional crosscuts communicating between the two, these being successively stopped up as a new one more advanced is formed; and the same is true of pits. On the small scale this principle is carried out in the use of air pipes or air boxes; usually square wooden pipes, with joints fitting into one another, and placed on timbers at the top of the level, or supported at one of the corners of the level, or, when they are employed on a larger scale—say two feet square—they will be placed on the floor; but in these latter cases it becomes a question whether a second level ought not to be preferred and introduced. In consequence of the objections to these pipes being of wood—their liability to decay, and to dry-rot, and the fungoid growths inside in moist places obstructing the current, and frequently imparting a disagreeable odor—other materials have been proposed and used, such as zinc, wrought-iron, cast-iron, etc., but in most instances wood is still preferred.

A natural ventilation is generally set up where you have two openings and these at different levels, where, for instance, in hilly ground you have an adit level from the side of the hill communicating with a vertical shaft opening higher up the hill, during a greater part of the year at least a current of air will pass through. And this current may be made to ventilate the parts beyond the shaft opening, Fig. 1, by leading air-boxes from the level between the shaft, S, and the mouth, M, of the adit, and continuing them to the end, E, closing up all other communication between the shaft and the lower part of the level by means of a door, D. Then when the air is going in the direction from the adit to the shaft it will follow the direction of the arrows in the figure.

If on similarly irregular ground, Fig. 2, we have two shafts, A, B, C, D, then leaving out of consideration, in both cases, the column of air above the level of the shaft, A, B, we have in the first shaft the pressure of the column, A, B; in the second, of the column, E, D. On a cold winter's day the column, E, D, will be the heavier, and a current of air will set down the shaft, C, D, and up A, B. On a hot summer's day the reverse is the case, the air in A, B will be colder than the column E, D, because the portion B, C is exposed to the sun, hence a current will now be established down A, B and up C, D. In the case of many mines, however, the ground is flat, and the shafts are of the same level. The necessary difference of level is sometimes secured by building up a regular stack over one of the shafts. But it may be that with equal shafts water dropping down one may cool the air there, and thus a tolerable ventilating current be set up and maintained. But in these cases a change in the weather may cause a stagnation in the air, and then artificial ventilation must be supplied, or the men withdrawn till the weather is again favorable. Mr. Nicholas Wood has shown that many thousand cubic feet of air can be driven through the mine per minute, in some cases by this natural ventilation alone.

#### Folding Ankle Boots.

We give herewith an illustration showing an improvement in boots and shoes, recently patented through the MINING AND SCIENTIFIC PRESS Patent Agency by Geo. C. Steinhauer, of this city. The portion which surrounds the ankle is formed of one entire piece, having only one seam at the rear; and this ankle piece is made of such a size as to easily allow the foot to pass in or out. In order to secure it snugly to the ankle after the foot is in place, the piece has triangular folds made upon each side, as shown. These folds may be slightly stiffened, or have lines of stitching at their edges, so as to fold back properly and lie smoothly inside the ankle piece, and in this manner the size of the ankle piece is reduced so as to fit snugly.

A strap is secured to one side and passes around behind the ankle, through a supporting loop, while a buckle upon the opposite side receives the end of the strap, which may thus be drawn up as tight as desired. This forms a neat and expeditious method of securing ankle boots, without the use of any buttons, strings or other fastening, except a simple strap, and without making any openings in the sides or front. The inventor's address is corner Second and Jessie streets, San Francisco.

\* Where the bed rock disintegrates on exposure to the air, i. e. soft bedrock, it is advisable to allow for considerable depth when practicable.

† Occasionally inclines are used.



## Ward District.

The Ward *Reflex* declares that Ward is an anomaly; a deviation from regular rule. It says that all experts and mining men who have examined the mines there give it as their very decided opinion that the district is unrivaled in eastern Nevada, if not in the State. It says the ores are marvelously rich, and most extensive and not refractory. In another article in the same paper is published an opinion by J. B. McGee that the ore vein (channel) in Ward is 500 feet wide. And yet the district languishes. A prospect which, if discovered in the vicinity of the Comstock would set the coast on fire, goes for naught in Ward. The editor of the *Reflex* must not forget that until some brave and capable man or company makes a success in opening and working the ores of Ward district nothing will be done. There are plenty of men in San Francisco who will gladly put \$1,000 in a mine when there is a sure, or apparently sure, promise of a return of \$2,000; but they shrink from investing \$500 when it is perfectly certain to a thorough miner that there would be a return of \$10,000, unless some mining men who have succeeded leads them. The California street crowd follow certain leaders always. Were a quiet miner of Ward to go to San Francisco, carrying with him proofs which would be perfectly satisfactory to miners that his property was good, the chances are five to one that men would not stop to investigate his showing for a moment. But, without a showing, if one of some dozen men in the city would speak well of a claim and buy a little of its stock the whole crowd would rush for it. Then there has been litigation in Ward, which is still unsettled, and which has chilled the hearts of more than one man who wished in real earnest to make an investment in that district. Finally, the main company which has been operating there has been most unfortunate, and has had a tendency to drive people away rather than to attract them there. When some men like J. B. McGee takes hold of the camp, and shows what a thorough man can do, there will be no more trouble. There will be plenty of men who will want stock in Ward and who will cheerfully pay for a little interest what they might now secure the control of the district for. Men try to be wiser about mining speculations than in anything else, and, as a rule, after all, do not trust their judgments at all, but rather follow the crowd or some one who, through lucky investments, has become an oracle. They will not touch Ward now because neither of the rich stock sharps of San Francisco are known to have an interest. But let one of those men invest in a mine in Ward; let him give \$25,000 for an interest and incorporate it with 100,000 shares, and say it is good, and the stock will sell readily at two dollars per share, even though the purchasers know that there is a mining proposition and a milling proposition, and forty other propositions, which will have a tendency to put off dividends. So, the men of Ward will have to half-sole their boots, reseat their pantaloons and rustle for a new sack of hoon, another hundred weight of flour, and wait until the tide, which is at the ebb now, shall begin to flow in favor of their district.—*Virginia Enterprise*.

**MINING TUNNELS.**—In working gravel claims where it is necessary to get a fall sufficient to carry off tailings from the bed of the channels, it is absolutely necessary to run tunnels to secure it. But in a majority of cases it is so much extra and almost useless expense to do such work, and particularly with prospectors with little money to open a mine with, it is not the wisest course to pursue. Many good ledges to-day lie idle because owners have exhausted all their means in trying to run a tunnel through hard bedrock to reach their ledge and had to give up before the object was accomplished. In most instances a tunnel will cost more than hoisting and pumping machinery, and all that is gained is an outlet for water without hoisting to the surface, where it is always needed for working the machinery. Those who are unable to purchase, can, in most cases, rent machinery and by so doing do systematic work toward permanent development. It is a mistaken idea to think of economizing by mining tunnels to open up quartz mines where owners have but little means.—*Nevada Gazette*.

**A NEW DISCOVERY.**—An extensive vein of silicated talc of a very superior quality has recently been discovered on the Homestead mining company's ground, lying but a few feet from and parallel with the company's ore vein. Several tons of the material have already been taken out and placed in store for shipment as soon as a market is found. This new and unexpected find, situated but a few dozen yards east from the Gold Hill *News* office, creates a new and interesting study for our local scientists, lying, as it does, in close proximity to a precious metal ore vein. It is also an additional attraction to the Homestead company's possessions, as they now have, within an area of three acres of surface ground, a true fissure vein of gold and silver bearing ore, a vein of silicon, a deposit of chromatic iron, and a living spring of alum water.—*Gold Hill News*.

**THE Dutch Flat Forum**, one of our Placer county exchanges, which commends itself for close attention to local mining interests, has just entered upon the third year of its existence.

## Good Placer Mines on South Boise.

Mr. J. B. Jones, just down from South Boise river brings substantial evidence of the richness of the mines on that stream and its tributaries. With two other men he has been operating during the present season, which has now about closed, on a section of the river about 24 miles above what is known as Junction bar, a point on the Rocky bar road. The distance from his claims to Rocky bar is 30 miles, and to Atlanta, across the mountains, about 25 miles. He worked one hydraulic pipe, using 125 inches of water from a ditch four miles long, constructed last spring. He and the men associated with him—five in all—own 20 acres of ground each, two claims being upon the main stream, and three upon a tributary called Smoky creek. The banks are 20 feet high, and the gold very evenly diffused through the gravel, which is easily washed. He estimates that his claims, which have been very thoroughly prospected, will pay, with good work, at least \$8 per day to the hand. There is a large extent of ground which prospects indicate to be equally good, sufficient to furnish claims for 500 or 1,000 men. Another company of three men mining upon Smoky creek, the present season, made a very satisfactory clean-up. Mr. Jones has well-founded hopes that he has secured a mining property which will suffice to insure him against the vicissitudes of fortune for the future. The miners in that section are all highly elated with their prospects and extensive preparations will be made for operating on a large scale next season. There is a wagon road to within 15 miles of the claims worked on the South Boise, and the country is easily traversed in any direction. The discoveries made in this region open up an extensive and rich field which will give a new impetus to placer mining in Alturas county.—*Idaho Statesman*.

**DEODORIZED PETROLEUM.**—A French chemist has devised the following process for removing the disagreeable odor of petroleum: Into 225 pounds of mineral oil he introduces, by means of a long funnel, two ounces of sulphuric acid and the same quantity of nitric, and about 11 pounds of strong alcohol is then poured carefully on the surface. The alcohol sinks gradually to the bottom, and coming in contact with the acids at the bottom, heat is developed with some effervescence. Ethernal products with agreeable odors are formed, and these impart a pleasant odor to the petroleum. The operation lasts about an hour; and after standing for 12 hours the mineral oil is siphoned off, and the remainder, a mixture of acids, alcohol and water, may be used for deodorizing the heavy oils, subsequently washing them with milk of lime. It is said that petroleum treated by the above process is sufficiently purified for use in pharmacy.

**ROCK CREEK.**—This district is in the northern portion of Elko county, and is making a very good showing. The Scorpion and Falcon mines are the two most noted properties in the district, and both bear promises of no mean caliber. The ledge has recently been struck in the Scorpion, which shows a two-foot vein, with ruby silver and black sulphuret ore in liberal quantities. The miners are much elated over the strike, and the property in the district is looking up. The northern portion of the State is giving indications of having been only half prospected.—*Eureka Republican*.

**CHLORIDING.**—Prospect mountain swarms with men, divided into little companies, engaged in extracting small bodies of ore; and the amount of ore reaching the furnaces from this source is very large in the aggregate. We are informed by a gentleman who is in a position to know, that at least 200 miners are following this chloriding business, and that their labor has been handsomely recompensed, the returns in most instances more than averaging ordinary miners' wages, and in some cases amounting to a snug little fortune.—*Eureka Sentinel*.

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Under the heading of the first chapter, "Testing Ores for Silver," we find paragraphs on ore formation, test for silver, with heat and water, acid or blow pipe. In speaking of testing for a process, the extent and richness of ore is considered, smelting ores, selecting and working sample, appliances for testing, roasting, etc. Under the head of "Working Ores" the author describes Aaron's process has something to say of superheated steam, preparation of dichloride of copper and protochloride of copper, use of copper and iron, quantity of chemicals, carbonate of lime, chloride ores, amalgam, Patten's process, etc. He also describes the methods of working roasted ores, treatment of base metals, stirring, heat of furnace, want of sulphur, etc. Under the head of "Leaching Processes" are the titles: Smelting, Mescal process, Chilean process, Krochne's process, etc. Under "Pulverizing Machines" are described the machinery and its construction and operation, stamp batteries, screens, Crocker's trip-hammer battery, Paul's pulverizing barrel, Kendall's battery, Noice's pulverizer, a cheap rock breaker, etc.

In speaking of amalgamators the author describes a cheap amalgamator, giving the ore, directions for making a barrel, preventing mechanical wear, use of quicksilver, copper bars, P. elberg barrel, cheap barrel trough, barrel on rollers, Aaron's amalgamator, separator, etc.

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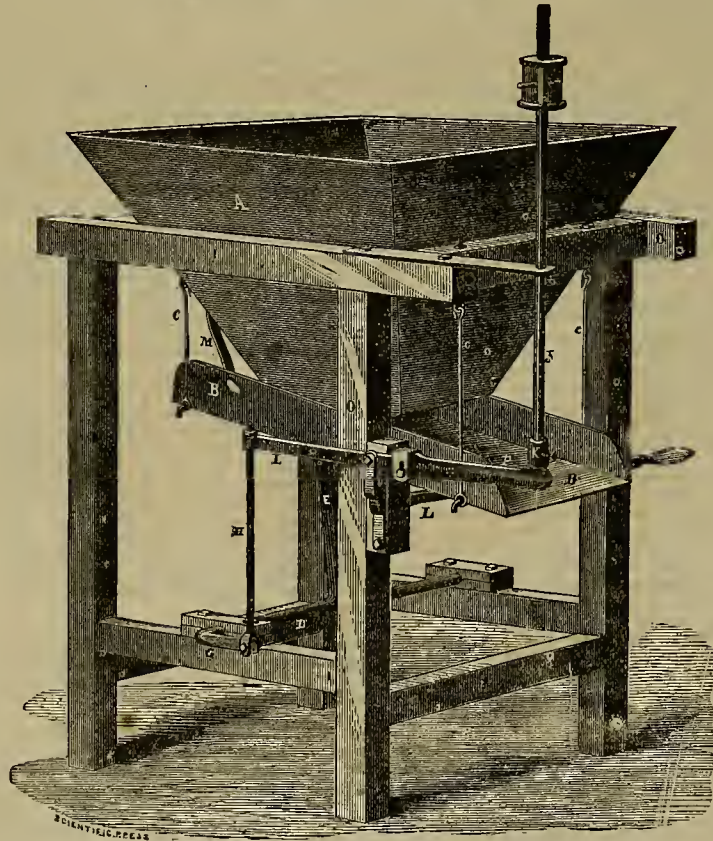
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Extract from a letter from C. G. Rodgers, Superintendent Green Mountain Mining Co., Plumas County, September 10th, 1877: After using both the Tulloch and Hendy Ore Feeders, side by side, for eight months, I can candidly say, that in my opinion, the Tulloch is much the best machine; it will feed any ore that can be fed by machinery; there is nothing about it to wear out, and should anything break, any blacksmith can repair it. Whereas, the Hendy machine is wearing from the moment it is started, and when any thing is worn out, or broken, you must have a machine shop or foundry to make the repairs. The Hendy Feeders are not in use at the Gold Stripe Mill; they were thrown out after a fair trial of some two weeks.

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Continued from Page 261.

opened out are richer and more extensive than any heretofore found in the mine. The furnaces will be started up on the 1st of November, and will make the most successful run since their erection. Several months' run is assured by the ore on the dump, and that in sight looks to indefinite prosperity. Mr. English gives an equally glowing account of the Gila mine in Revelle district. He says that the 10-stamp mill of that company will start up to-morrow, and that the most encouraging results may be expected.

#### WHITE PINE DISTRICT.

**BULLION SHIPMENTS.**—White Pine News, Oct. 20: Wednesday the Eberhardt & Aurora shipped by Wells, Fargo & Co. bullion valued at \$16,022.41, and on the same day the Stafford company shipped bullion valued at \$10,029.55.

**ANOTHER ORE CHAMBER.**—We are informed, by what we consider pretty reliable authority, though in no way official, that another ore chamber has of a certainty been discovered in the Eberhardt & Aurora mine on Treasure hill. Our informant states that the new ore chamber was discovered while following the stringers leading from the old chamber, but as to its extent and richness nothing is yet known, on the outside at least, for it seems to be the object of the management at present to keep the new discovery a secret. It is also stated that Capt. Drake's trip to San Francisco at this time is for the purpose of getting new machinery for the company's mill, which, after some necessary repairs, will soon be started up again and run all winter. While the miners working underground maintain an ominous silence in regard to the new strike, the people of Treasure hill and Eberhardt are confident that new and important developments have already been made in the Eberhardt & Aurora mine.

**THE NEW FURNACE.**—We learn that the King mining and smelting company are busily engaged on their new furnace at the Three-mile house. Mr. George Phillips, the engineer of the company, is now making the preliminary arrangements for putting up the machinery, which is expected to arrive in a few days.

**THE STAFFORD RUN.**—The Stafford company have finished a run of five weeks at the Eberhardt mill. About 700 tons of ore were crushed, which yielded \$23,000. The ore was worked up to over 80% by David Scanlan, the assayer for the company. This is 10% more than they expected. The boys have quite a nice stake, and now winter will pass over them lightly.

#### Arizona.

**BULLION.**—Arizona Miner, Oct. 12: The shipment of Peck bullion from the Azilan mill for to-morrow morning is only two bars, aggregating but \$3,417.44, a falling off, from some cause, of nearly \$2,000 from the recent tri-weekly shipments.

**TIP-TOP.**—Several contracts have been let for sinking shafts, etc., and Mr. Gillette has about 30 men at work on the mine and about the mill site. Everything is represented to be booming in that locality, and the mill will be up and running just as soon as money and enterprise can possibly bring it from San Francisco and set it up. There appears to be more work and less foolishness about the operations at the Tip-Top than anything that has hitherto been undertaken on so large a scale in Arizona.

**MINING ENTERPRISES** in the various districts have assumed a formidable shape, and work of a telling character is being prosecuted on many of the lodes.

**THE PECK COMPANY** are, with their poor facilities of working their ore, taking out \$10,000 per month. We consider their financial poor from the fact that all the ore has to be packed out on mules to their Azilan quartz mill, 30 miles from the lead, and over a rough country. This, however, will soon be done away with, as they have opened a wagon road to their mine and have succeeded in landing their new mill directly on the ground where it is to be erected.

**THE TURKEY CREEK MINES** are receiving their share of attention; work of a character that indicates business is going on steadily. These mines are situated on a tributary of the Salmon river, and are about 150 miles north-east of this city, via Idaho City and Banner. There is a wagon road from Idaho City to Banner, a distance of 25 miles, and from Banner to the mines on Yankee Fork the distance is 80 miles, over a mountain trail which has been used during the present season for packing ore to Craft's mill at Banner. Much of the ore taken from the ledges at Yankee Fork has been shipped through Montana to the railroad, and thence East for reduction. The ledges at recently discovered are numerous, and the fact that the ore can bear transportation so far fully establishes the richness of the veins. Mr. L. H. McFur, a practical quartz miner of many years' experience, has recently visited these mines and is much impressed with their importance and value. The developments thus far made, though partial, have convinced every one that a rich field is here opened which will add greatly to the mineral wealth of Idaho.

**THE BLACK WARRIOR** is one of the brightest constellations in the way of mines in the county and is being developed by home capital.

**MR. BRADSHAW** has the same glowing accounts come in to us from the numerous miners employed in the work of examining nature's vaults of minerals, in fact from every section of the county the reports are most favorable. New discoveries are reported daily and some of a very high and valuable nature, all of which has a tendency to make our future outlook bright and encouraging.

#### Idaho.

**YANKEE FORK MINES.**—Idaho Statesman, Oct. 20: All accounts from the locality known as Yankee Fork agree in representing it as one of the most promising mining districts in Idaho. These mines are situated on a tributary of the Salmon river, and are about 150 miles north-east of this city, via Idaho City and Banner. There is a wagon road from Idaho City to Banner, a distance of 25 miles, and from Banner to the mines on Yankee Fork the distance is 80 miles, over a mountain trail which has been used during the present season for packing ore to Craft's mill at Banner. Much of the ore taken from the ledges at Yankee Fork has been shipped through Montana to the railroad, and thence East for reduction. The ledges at recently discovered are numerous, and the fact that the ore can bear transportation so far fully establishes the richness of the veins. Mr. L. H. McFur, a practical quartz miner of many years' experience, has recently visited these mines and is much impressed with their importance and value. The developments thus far made, though partial, have convinced every one that a rich field is here opened which will add greatly to the mineral wealth of Idaho.

**MINING NOTES.**—Owyhee Avalanche, Oct. 20: The Oro Fino mine and works were sold on Saturday, C. W. Moore was the purchaser. Everything looks bright for the Poorman. Mr. Baldwin will probably start up the mine at an early day. There are about 30 men employed at the Wagon-ton mines and mill. Frank Lepile is talking out ore that will yield \$150 to the ton. Wilbur & Ryan are doing well at the Crown Prince. C. and J. Brunzell are getting out plenty of \$60 rock from the J. B. Dodd mine. The Webfoot will start up soon. The outlook for that camp is improving. Ben Davis has some rock assayed from the Sultan recently, and it went over \$200 to the ton. Work is progressing favorably at the Polost. More stops will be started soon. There is a considerable quantity of rock out awaiting shipping, and some of it will average as high as \$100 to the ton. At the Black Jack everything wears a flourishing appearance. The ledge is growing better as the work progresses, and great hopes are entertained in connection with the future of Florida mountain.

#### Montana.

**OUR QUARTZ MILLS.**—Butte Miner, Oct. 16: The Burlington mill is the only one running in this vicinity at present, but the Walker Bros. 15-stamp mill is about finished, steam having been raised day before yesterday. It is expected to make a final start this week. The repairs on the Dexter will be completed within two or three days, and that mill will also be set to work. Judge Davis will doubtless remedy at once the damage caused by the late accident in his mill, and it is only fair to presume that the owners of the Centennial are not going to allow that valuable property to rot in idleness. We are on the eve of a great revival of the mining and milling industry in Butte.

#### Oregon.

**PLACERS.**—Redrock Democrat, Oct. 17: The placer claim of Messrs. Baisley & Bulger, near Pocatobas, eight miles northwest of this city, has yielded the handsome

sum of \$11,000 this season. The work was done with hydraulic pipe and the labor of four men within the period of six months. This is only one developed placer claim. There are many claims equally as good in this vicinity waiting for patient labor and capital to develop their wealth.

The rich placer mines owned by the Lynch Bros., near Independence, Grant county, yielded handsome returns during the past season.

#### The Philosophy of the Hendy Concentrator.

[Written for the Press by CHAS. C. RUEGER, M. E.]

A comprehensive essay on wet concentration and the apparatus used therein, not long since appeared in the columns of the Press, from the pen of Mr. Francis Cazin. In enumerating and describing there, the various appliances of acknowledged merit for working fine sands, I think an injustice has been done to a California inventor, by excluding his machine from the list. Whether this was done because of a lack of knowledge of the efficiency of the machine, or because the experience with it had not been considered sufficiently favorable, I do not know. It would seem that the Hendy pan has been too long before the mining public to be unknown in any place where concentrators are needed. This leads to the conjecture, that the machine has not always been used to advantage, though much has been said in favor of it, and it will not be amiss to investigate some of the causes which have given rise to the differences of opinion regarding the merits of the machine. Such discussions, it is hoped, will only further and improve, and, by the statements of practical experience and observations, save others from a repetition of expensive yet fruitless experiments.

It cannot be denied that the working of the Hendy pan has frequently been unsatisfactory, although apparently all reasonable care was used in the management. This was caused in no small degree by mechanical defects, notably by the earlier arrangement used for the distribution of the ore pulp, insufficient provision for the maintenance of steady motion, and other parts of the machine since improved in construction. The improper regulation of the water and pulp supply, and an effort to do too much in one machine, and concentrate too highly at one operation, were also common reasons for the want of success. The condition of the sands to be separated, by peculiarities of the fracture, proportion of sizes, and properties of the component parts, causing excessive cohesion and insufficient freedom of motion, often unavoidably give rise to difficulties not experienced in the treatment of other sands, though the general characteristics of the two ores may be very similar.

The manner and extent in which these influences may exert themselves, may be deduced in a measure from a consideration of the agencies, to which the separating and concentrating action of the pan may be mainly ascribed, in so far as they come within the scope of our knowledge of positive natural laws, our observation and logical inferences.

The action of the Hendy pan represents that of a distinct class of concentrating machines, and differs materially from that of other successful machines in practical use. It comprises, really, several distinct actions, representative of our most approved means of concentration, the fortunate, though, perhaps, by the inventors, an unanticipated combination of which, enables the machine to work mixed sands—that is, unsized and ungraded—with better results than can be attained with any other machine in general use at present. Characteristic of the machines of this class is the sifting action, to which the separation in them is principally due; besides this we have the inclined plane action of the concave huddle, the centrifugal one of the dolly tub and separating funnel, and also that of direct displacement due to density. Near the surface and periphery we have also the separating effect produced by the difference in the initial falling speed of differently dense particles in still water.

#### Separation by Suspension and Subsidence.

The law in this latter regard, as worked out by Rittinger, is: In falling in still water, the denser of equal sized particles precedes the less dense; the same is the case, though in a less degree, with equal falling particles (particles assorted according to their equivalent speed of fall in water). It follows that the density, as well as the duration of subsidence, will determine the limits of size necessary to produce separation under this action. In its bearing to the Hendy pan, it is sufficient to know that this limit reaches beyond the dimensions of equal falling particles, because then the conditions favorable for the sifting action are attained, and come to our further aid in separation.

The alternating periods of suspension and subsidence, necessary to the development of this action, are produced in the pan by the changes of speed in the course of the oscillations, as they naturally result from the transmission of a regular rotary to a reciprocating motion.

If the accelerating motion of the connecting rod, in passing between the dead centers, is sufficient, the inertia of the particles will cause a retrograde motion of the sand in relation to the pan, which will be greatest near the surface,

where there is the greatest freedom of motion, assisted by the free development of the inertia of the water. The resulting projection of the upper particles against the lower ones, resolves itself into a projection in the direction of the greatest freedom of motion, which can only be an upward one. The inertia of particles will be proportional to their absolute weight, and the resulting projectile force developed under like conditions holds the same ratio. But the ratio of resistance to elevation will be as the densities diminished by one, the density of water. Of equal sized particles the less dense would tend to go somewhat higher consequently, and in this it is assisted by the free development of the inertia of the water, which produces currents, again tending to carry upwards the lighter particles. In the case of equal falling particles, provided they do not exceed certain limits of size, and the speed of the pan is sufficient, the action is the same, though in a less degree. In the periods of subsidence, resulting from the passage of the dead centers, the denser particles will reach a lower position than the less dense, the proportion of weight to resistance being in their favor.

Taking the case of quartz and iron pyrites, the inertia would be for equal sizes as their densities, or 2.6 to 5, and the forces of upward projection will hold the same ratio. The resistance to elevation will be as 1.6 to 4; the resultant to elevation will therefore be as 10.4 to 8, in favor of the elevation of the quartz. The carrying tendency of currents of water resulting from its inertia, will be in favor of elevating the quartz in a ratio dependent on speed of action and duration.

After each suspension, the particles will fall in the water with different speed. Supposing the machine to make 200 oscillations per minute, and that the free fall can take place during one-tenth of the oscillation, or 0.03 of one second of time, a grain of quartz one millimeter in size, or 1.25 inch diameter, would fall or sink 2.4 millimeters, while a particle of pyrites of the same size, would, in the same time, sink 3.26 millimeters, and consequently would gain on the quartz with each semi-oscillation 0.86 millimeters, or about 1.30 of one inch. If the whole depth to be traveled by the heavier particle, to reach the bottom, is three inches, it would therefore take about 45 oscillations, or about one-quarter minute to separate.

With particles of ore which have been graded the conditions are somewhat different. In this case the ratio of diameters of the particles will be approximately as their densities, diminished by the density of water. That is, the particles of quartz will have 2½ times the diameter of the pyrites particles, 15.6 times their volume, and eight times their absolute weight. The projectile forces would hence be as 1 to 8, the resistance to elevation as 1 to 6.24, leaving projection in favor of the elevation of the quartz. The influence of the upward currents of water would depend, however, on their speed relative to the size of the particles, for in an upward current of low velocity, the less dense particle has less negative motion than the denser, whereas, with a sufficient velocity of the current, this motion is reversed. From this the resultant effect on particles of various size can be inferred.

During subsidence the denser though smaller and lighter particle, will fall most rapidly, the difference of fall in the same time being not more than 20% less than in the case of equal sized particles. It is on this principle of suspension and subsidence that jiggers work so successfully.

#### Separation by Displacement.

But the trouble is, that complete suspension is attained in the Hendy pan only near the surface, while towards the bottom there is only a slight sifting motion to the sand. Therefore the sulphurets may readily disappear below the surface of the sand, but will soon reach a point where all possibility of the above described favorable action ceases, long before the bottom is reached, and they can penetrate further only by displacement of the quartz, unless they are fine enough to separate by the sifting action hereafter to be described.

Gravitation, acting on matter free to move, tends to arrange its components, from mechanical admixture, in the order of their density, and the rapidity with which this natural arrangement takes place, depends on the difference in densities and the sum of the resistances. In the case of fluids, these resistances depend on their viscosity alone; in the case of solid particles, on friction and cohesion, and the condition of the fluid medium necessary to mediate mobility. In the latter case, however, the ratio of gravities is changed, these being diminished by the density of the fluid medium. In the cases of wet concentration, the pressure downward exerted by the ore particles, will be proportionate to their density diminished by the density of water or in the case of quartz and iron pyrites, as 1.6 to 4. Therefore each particle of pyrites will counterbalance about 2½ times its volume of quartz. Any accumulation of the denser mineral in excess of this must cause a tendency to displacement of the less dense, by reason of the greater weight of the former, provided the particles of quartz were free to move. Their movement is, however, retarded by friction and cohesion, which latter is proportional to the surface of contact. The direction of thrust is also unfavorable to the downward movement of the heavier particle. The shifting of the particles, caused by the oscillations of the pan, assists the denser particle in wedging its way downward, by reason of its inertia reacting on the surrounding lighter particles. The poorer the ore the more difficult

the separation by these means, because the dense particles are surrounded by a much greater number of the less dense, which tend to keep in the same level, and thus combine to resist the displacing action of the particles.

This displacement, due to gravity alone, takes place principally during the periods of subsidence following the periods of suspension, while the crank pin passes the dead centers. The tendency at the height of motion being to raise the level of the sand at the periphery by centrifugal force, the decrease of motion at the end of the stroke will permit the particles to sink to rest and seek a level. It is thus that the denser accumulation towards the periphery, pulsating to the influence of varying centrifugal force, as by an ebb and flow of the tides, in its subsidence lifts the less dense inner accumulation of the pan into the sweep of the current to the central discharge.

To adjudge the effect of the centrifugal action of the pan, we must consider the law governing the motion of particles in water under such impulse.

#### Centrifugal Action.

The centrifugal force of particles is proportional to their absolute weight. Particles answering to the formula (diam. A)<sup>3</sup> sp. gr. A = (diam. B)<sup>3</sup> sp. gr. B, will therefore go together, where the water itself takes part in the centrifugal motion, as is the case in the Hendy pan; where it does not, as in the separating funnel, the motion being constant, the formula becomes (diam. A)<sup>3</sup> (sp. gr. A—1) = (diam. B)<sup>3</sup> (sp. gr. B—1). The rules to be deduced from the former conditions are:

1. The centrifugal force of equal sized particles increases in the direct ratio of their densities.

2. The centrifugal force of equally dense particles increases in the ratio of the cubes of the diameter.

3. Of graded particles, the denser has the least centrifugal force.

In the latter case, for instance, we have for quartz, sp. gr. 2.6; centrifugal force = 1. Iron pyrites, sp. gr. 5.2; centrifugal force = 0.111. Galena, sp. gr. 7.5; centrifugal force = 0.039. That is, with equal falling or graded particles of quartz, iron pyrites and galena, the centrifugal force of the pyrites is only 11%, and that of the galena only 4% of that of the quartz.

It is evident that this can effect but a limited separation, for it admits such only between the largest and smallest particles of sand, while the intermediate sizes of particles, answering to the above formula in a graduated scale, will remain mixed in concentric zones, merging between the extremes of separation.

The effect is analogous to that of grading, or the separation of particles according to their speed of fall in water, with the difference that while the diameters of equal falling particles in water, for instance in the case of galena and quartz, are as 1 : 4, they will be by centrifugal grading as 1:1.28 only. This shows that the effect approaches that of sizing with screens, in proportion to the decrease in the difference of density of the particles to be separated, and partakes more of the nature of grading, with the increase of such difference. It follows from this, also, that the effect of centrifugal action will favor the sifting action of the pan, in the ratio of the increase of density of the mineral to be separated, for the reasons hereafter shown.

#### Inclined Plane Action.

But this action of centrifugal force can only take place below the surface of the sands; on the surface it is counteracted by the inward current of water, which takes effect under conditions similar to those presented in the concave buddle, or huddle with central discharge. The centrifugal impulse given to the pulp in the pan causes it to rise one-quarter to one-half inch higher at the periphery than at the central discharge, and the surface of the sand thus takes the form presented in a flat concave buddle. The water, passing over the surface of the sand, on its way to the central discharge affects the particles in the same way as it does on inclined plane concentrators generally, with the difference only, that the current does not act in a direct or radial line to the discharge, but in a curvilinear course. The action is therefore a diagonal one, comparable, though not strictly, to that on the stationary, concave huddle with intermittent action, such as the Payne & Stevens; or, considering the centrifugal force as taking the place of the transversal percussion, the action is also comparable to that of the Rittinger percussion table. To those not familiar with these machines, I may explain that the tendency of a shallow current of water running down an incline plane with particles of different densities, is to move forward most rapidly the larger and the less dense particles, the rule, however, being qualified by the form of the particles also; a round particle of a denser mineral rolling more readily than a flat or disc shaped particle of a less density, though the latter may be considerably lighter than the former. Assuming particles of the same size and form, the impingement of the water would be the same on both, but the friction of the two with the surface of the incline plane, would be proportional to their density or weight, modified somewhat by the varying condition of the surfaces of contact. In the case of quartz, sp. gr. 2.6, and galena, sp. gr. 7.5, the former would travel down the incline in about one-third the time required by the latter. In the case of properly graded sands, the average proportion between the diameters of galena and quartz would be as 1 to 4, and the



leverage of the water to roll the particles down the incline holds the same ratio. The ratio of the surfaces of impact is as 1 to 12.56. If now these particles are placed together on an incline plane, and subjected to a shallow but continuous current of water, it is evident, that the water will act with greater force on the less dense particle, and at the same time the greater leverage, proportionate to its greater diameter. The ratio of forces thus derived will be as 1 to 50, in the case assumed. The weights, however, of the two particles are as 1 to 23, or in water, as here to be considered, as 1 to 15.8, and consequently the frictional resistance of the quartz to rolling action is about 16 times that of the galena. The ratio of motion will, therefore, be as 1 to 50-16 = 1 to 3.1 in favor of rolling the quartz.

This presumes an equal speed in the current of the water in its entire depth. The current, however, is less rapid in the lower strata, on account of the friction caused by contact with the plane, thus giving proportionately less impact against the smaller particles. It is evident, therefore, that the quartz will travel down the incline plane faster, so long as the speed of the current necessary to overcome its friction, does not suffice to cause suspension of the galena. This limit of action will be reached when the depth of current necessary to move the large particle, exceeds a certain proportion to the size and weight of the smaller particle; for the depth of the current will decide the speed, all other things remaining unchanged.

In the argument so far, a smooth surface of the plane has been assumed, such as is presented in the machines working continuously on this principle. Where the sand itself forms the surface of the inclined plane, as is the case in buddles, etc., of intermittent action, which presents more nearly the conditions in the Hendy pan, the factor of frictional resistance is further modified in favor of the denser particles, especially the smaller ones, because they sink most into the depressions of the surface and proportionately out of reach of the current.

### Another Colliery Disaster.

The telegraph brings us news of another horrible mining catastrophe, which occurred on Monday, at the colliery at High Blantyre, near Glasgow. Some 233 men descended into the mine on the morning of the explosion, only five of whom were rescued alive. The colliery comprises two pits with communication between them. In one of the pits 40 corpses were found at the bottom of the shaft. A faint knocking was heard, but as it was impossible to work at that part of the mine, on account of caving ground, the rescuing party is attempting to communicate with the men from another mine. Mining experts say that all the men in the pits must have perished, but even if any were alive no rescuing party could reach them in less than eight or ten days. The explosion was of a terrific nature, and all the bodies recovered are fearfully burned and mangled.

**LINDERMAN'S NEW BOOK.**—A treatise on money and legal tenders of the United States, by Dr. Linderman, Director of the Mint, will be issued by one of the New York publishing houses in a few days. It gives a clear and succinct definition of the various technical terms ordinarily used in connection with bullion, mining and money, and reviews legislative enactments upon these subjects from the Declaration of Independence to the present time. Credit obligations of the United States are referred to in detail, and the various propositions for the remonetization of silver are considered. A chapter on Exchange and Trade Dollars contains full information on these two subjects, which are of growing importance to American commerce.

**BULLION SHIPMENTS.**—Since our last issue shipments of bullion from prominent mines have been as follows: Northern Belle, Oct 14th, \$8,365.20; Standard, 15th, \$41,822.64; California, 17th, \$208,293.96; Leopard, 18th, \$3,500; Coso Con., 16th, \$1,523.10; Modoc, 16th, \$3,681.04; Grand Prize, 20th, \$16,800; Northern Belle, 16th, \$4,763.55; Arizona, 17th, \$1,499.37; Northern Belle, 18th, \$4,182.40; California, 20th, \$125,780.28; Arizona, 20th, \$1,073.86; Endowment, 20th, \$2,722.04; Meadow Valley, \$6,500; Con. Virginia, 20th, \$94,683.18; Indian Queen, 15th, \$4,301.31; Modoc, 20th, \$8,413.34; Grand Prize, 24th, \$16,900; Leopard, 23d, \$3,800; Endowment, 13th, \$1,801.

**COMPROMISED.**—A compromise between the Virginia Board of Aldermen and the mining companies has been effected. The mines will pay all back taxes, amounting to \$51,340, on condition that they shall be released from the penalties of delinquency. The rate of city taxation has been reduced from \$2.50 on the \$100 to 60 cents on the \$100.

In the suit of the Emma mining company vs. Trenor W. Park, Judge Shipman, of the United States Circuit Court, dismissed the complaint, the plaintiff not appearing. This is the end of the Emma mine suits.

LEAD is selling in Liverpool at £20 2s. 6d. to £20 10s. per ton for good ordinary brands.

QUICKSILVER is selling at £7 2s. to £7 5s. per flask in London.

## PATENTS AND INVENTIONS.

### List of U. S. Patents Issued to Pacific Coast Inventors.

[FROM OFFICIAL REPORTS FOR THE MINING AND SCIENTIFIC PRESS, DEWEY & CO., PUBLISHERS AND U. S. AND FOREIGN PATENT AGENTS.]

By Special Dispatch from Washington, D. C.

WEEK ENDING OCTOBER 9TH, 1874.

FRUIT DRIER.—Wm. S. Plummes, Portland, Oregon.  
WASHING MACHINE.—Louis Rivers, Auburn, Oregon.  
ROB CUTTING.—Theodore D. Culter, Westminster, Cal.  
FORMING AND LINING DITCHES, FLUMES, ETC.—John P. Culver, S. F.  
PRESERVING WOODEN PILES AND TIMBER.—John P. Culver, S. F.  
WELL BORING APPARATUS.—Jeroimo Hass and James Manning, Stockton, Cal.

#### RE-ISSUES.

ORE STAMP FEEDERS.—James Talloch, Jamestown, Cal.  
—The patents are not ready for delivery by the Patent Office until some 14 days after the date of issue.  
NOTE.—Copies of U. S. and Foreign Patents furnished by DEWEY & CO. in the shortest time possible (by telegraph or otherwise) at the lowest rates. All patent business for Pacific coast inventors transacted with perfect security and in the shortest possible time.

### General News Items.

GENERAL GRANT has gone to Paris.

THE steamship *Teutonia*, drawing 20 feet 9 inches, went to sea through the southwest pass from New Orleans, one day this week, without detention.

THE amount estimated for carrying inland mails the coming fiscal year is \$20,889,270, an increase over the estimates for the current year of \$2,030,297.

A STIPULATION against suicide in an insurance policy releases the company when self-destruction is committed. So the United States Supreme Court decides.

THE principal buildings of the Champs de Mars and Trocaderas, Paris, for the exhibition of 1878, have been completed, and the interior arrangement commenced.

THE reward offered for the capture of Duncan, the Pioneer Savings Bank defaulter, is \$6,000. The creditors of the bank offer \$5,000, and the Governor of California the other \$1,000.

THERE have been 12 vessels cleared, so far, the present month, with wheat for Great Britain. During the same period in 1876 there were 36.

In the Episcopal convention the question was briefly discussed as to what efforts should be made to evangelize the Indians on the Pacific coast. The project was warmly approved.

THE season at Emigrant Gap, Placer county, is about closed. The mills have all shut down, and are now preparing for winter. The shakes, wood, etc., are about all hauled in, and nothing remains to be done until the opening of the next season.

SAMUEL HUMPHRIES and Edmund Smith, who pleaded guilty of burning Lebanon Valley bridge during the late riots, were each sentenced to imprisonment at Reading for five years and a fine of \$1,000. The cases of 37 rioters have gone over, owing to the discharge of the jury in consequence of the manifest bias of two.

THE carpenters of the San Joaquin and Kings river canal are constructing the great dam across Los Banos creek, which has to be finished before the heavy rain sets in. Messrs. Miller & Lux have granted the right of way to the West Side Railroad Company for a distance of 57 miles.

THERE being no export demand at present for trade dollars, the Secretary of the Treasury has ordered the Director of the Mint to discontinue the receipt of deposits therefor at the several Mints until further instructed, and a general order to that effect, applicable to all Mints, was issued on Saturday.

THE failure is announced of the Carvill Manufacturing Company, engaged in carriage manufacturing on Jessie street. The liabilities of the firm are estimated at \$50,000, and the assets \$80,000, about \$21,000 unincumbered. Many of the workmen suffer from the failure. An assignment has been made to A. S. Meeker, of Meeker, James & Co., and D. T. Root.

OUR LOVED ONES.—Taken years ago when photography was in its infancy, the pictures of our loved ones are sometimes fading away, even as did they themselves. Copied and retouched by Morse, they again assume the expression and brightness we remember so well, and are treasures to us here. Enlarging such old pictures is one of Morse's specialties, at No. 417 Montgomery street.

THE famous Emma mine made its first shipment of ore on the 23d inst., after being shut down five years. The ore is of a high grade. Thirty men are employed in the mine, and the lessee asserts that hereafter shipments will be made every day.

PATENT SUIT.—Action has been commenced in the Federal Courts by Joshua Hendy against Ira P. Rankin, et al., of the Pacific Iron Works, and E. T. Steen, for an alleged infringement on Mr. Hendy's ore feeder patent.

WOONWARR'S GARDENS has the following new attractions: The buffalo chase; large whale skeleton; new museum; improvements in the zoological department, besides the other features which have made it popular.

## METALS.

[WHOLESALE.]

THURSDAY, M., October 25, 1877.

IRON.—		
American Pig, ton.	28 00	@ 32 00
Scottish Pig, ton.	32 00	@ 33 00
White Pig, ton.	28 00	@ —
Oregon Pig, ton.	—	@ —
Refined Bar.	34 00	@ 61
Home Shoes, keg.	5 00	@ —
Nail Rod.	—	@ 75
Norway, Oral.	—	@ 71
Rolled.	—	@ —
COPPER.—		
Copper-Tinned.	37 00	@ 40
Sheeting, lb.	37 00	@ 40
Sheeting, Yellow.	21 00	@ 23
Sheeting, Old Yellow.	10 00	@ 11
Composition Nails.	21 00	@ —
Composition Bolts.	21 00	@ —
STEEL.—		
English Cast, lb.	14 00	@ 5
Anderson & Woods, ordinary size.	16 00	@ —
Drill.	16 00	@ —
Flat Bar.	15 00	@ 13
Flow Steel.	84 00	@ 12
TIN PLATE.—		
Box 14 C Charcoal.	8 50	@ 9 00
Banca Tin.	24 00	@ —
Australian.	18 00	@ 20
ZINC.—		
By the Cask.	11 00	@ —
Zinc Sheet 7 1/2 ft. 7 to 10, lb.	11 00	@ —
7 1/2 ft. 11 to 14.	11 00	@ —
8 1/2 ft. 8 to 10.	12 00	@ —
8 1/2 ft. 11 to 10.	12 00	@ —
NAILS.—		
Assorted sizes.	3 00	@ 35
QUICKSILVER.—		
By the lb.	47 1/2	@ 50

## LEATHER.

[WHOLESALE.]

WEDNESDAY M., October 24, 1877.

Sole Leather, heavy, lb.	26 00	@ 29
Light.	22 00	@ 24
Jodot, 8 Kil, doz.	48 00	@ 50
11 to 13 Kil.	65 00	@ 76 00
14 to 16 Kil.	60 00	@ 60
Second Choice, 11 to 16 Kil.	55 00	@ 70 00
Cornellian, 12 to 16 Kil.	57 00	@ 67 00
Females, 12 to 16 Kil.	63 00	@ 67 00
14 to 16 Kil.	71 00	@ 75 00
Sinon Ulmo, Females, 12 to 16 Kil.	58 00	@ 62 00
14 to 15 Kil.	66 00	@ 70 00
16 to 17 Kil.	72 00	@ 74 00
Sinon, 18 Kil.	61 00	@ 63 00
20 Kil.	66 00	@ 67 00
24 Kil.	72 00	@ 74 00
Robert Calf, 7 and 9 Kil.	35 00	@ 40 00
Kips, French, lb.	1 00	@ 1 35
Cal. doz.	40 00	@ 60 00
French Sheep, all colors.	8 00	@ 15 00
Eastern Calf for Backs, lb.	1 00	@ 1 25
Sheep Roans for Topping, all colors, doz.	9 00	@ 13 00
For Linings.	5 50	@ 10 50
Cal. Russet Sheep Linings.	1 75	@ 4 50
Boot Legs, French Calf, pair.	4 00	@ —
Good French Calf.	4 00	@ 4 75
Best Jodot Calf.	5 00	@ 5 25
Leather Harness, lb.	1 50	@ 2 00
Fair Bridle, doz.	43 00	@ 72 00
Skirting, lb.	33 00	@ 37 00
Welt, doz.	30 00	@ 50 00
Buff, ft.	18 00	@ 20 00
Wax Side.	17 00	@ 18

## Gold, Legal Tenders, Exchange, Etc.

[Corrected Weekly by SUTRO & Co.]

SAN FRANCISCO, October 24, 3 P. M.

LEGAL TENDERS IN S. F., 11 A. M., 99@38 1/2. SILVER, 4@31  
GOLD IN NEW YORK 102 1/2  
GOLD BARS, 900, SILVER BARS, 9@15 1/2 cent, dis.  
count.  
EXCHANGE ON NEW YORK, 1 1/2% on London bankers, 4 1/2%  
Commercial, 4 1/2%; Paris, five francs @ dollar; Mexican dollars,  
56.  
LONDON CONSOLS, 95 3/16; Bonds, 100 1/2.  
QUICKSILVER IN S. F., by the flask, 47 1/2@47 1/2.

## Signal Service Meteorological Report.

Week Ending October 23, 1877.

HIGHEST AND LOWEST BAROMETER.						
Oct. 17.	Oct. 18.	Oct. 19.	Oct. 20.	Oct. 21.	Oct. 22.	Oct. 23.
30.07	30.17	30.00	30.02	30.04	30.01	30.08
30.01	30.07	29.98	29.96	29.97	29.94	30.01
MINIMUM AND MAXIMUM THERMOMETER.						
61	61	66	64	62	63	64
50	49	52	51	56	56	56
MEAN DAILY HUMIDITY.						
81	81	77	83	80	85	75
PREVAILING WIND.						
W	W	W	SW	W	SE	NE
WIND—MILES TRAVELED.						
171	236	175	231	100	177	185
STATE OF WEATHER.						
Fair.	Fair.	Fair.	Cloudy.	Rainy.	Rainy.	Fair.
RAINFALL IN TWENTY-FOUR HOURS.						
				.27	.35	.01
Total rain during the season, from July 1, 1877.					0.65 in.	

THE Large Circulation of the MINING AND SCIENTIFIC PRESS extends throughout the mining districts of California, Nevada, Utah, Colorado, Arizona, Idaho, Montana, British Columbia, and to other parts of North and South America. Established in 1860, it has long been the leading Mining Journal of the continent, its varied and reliable contents giving it a character popular with both its reading and advertising patrons.

EVERY new subscriber who does not receive the paper and every old subscriber not credited on the label within two weeks after paying for this paper, should write personally to the publishers without delay, to secure proper credit. This is necessary to protect us and the subscribers against the acts and mistakes of others.

"More than Pleased."

OSCEOLA MINE, NEVADA CO., CAL., April 10th, 1877.

MESSESS. DEWEY & CO.—Gentlemen:—We are more than pleased with your professional ability in the management of our application, and will always recommend your competency as Patent Attorneys, and your honorable and gentlemanly dealings with clients. Truly and respectfully yours,  
LOUIS R. TULLOCH.  
THOMAS D. TULLOCH.

## To Mining Secretaries.

An amendment to Section 336 of the California Code, taking effect July 1st, 1874, provides that in addition to the regular publication, daily or weekly, of the assessment and sale notices as heretofore,

### PERSONAL NOTICE

Must be served as provided in the following quotation from the law:

"The notice must be personally served upon each stockholder, or in lieu of personal service, must be sent through the mail, addressed to each stockholder at his place of residence, if known, and if not known, at the place where he principal office of the Corporation is situated."

The above refers to the ASSESSMENT NOTICE only. Advertisers in the MINING AND SCIENTIFIC PRESS will be furnished with copies of assessment notices printed on slips suitable for serving personal notice under this law at short notice.

DEWEY & CO., Publishers.

## Mining and Other Companies.

Persons interested in incorporated shares will do well to recommend the publication of the official notices of their companies in this paper, as the cheapest appropriate medium for the same.

### California and Oregon Land Company.

Location of principal place of business, San Francisco, California. Location of works, Jackson County, Oregon. Notice is hereby given, that at a meeting of the Board of Directors, held on the seventeenth day of October, 1877, an assessment, No. 1, of thirty-five cents per share was levied upon the capital stock of the corporation, payable immediately in U. S. gold coin, to the Secretary, at the office of the company, 418 California Street, San Francisco, California. Any stock upon which this assessment shall remain unpaid on the twenty-eighth day of November, 1877, will be delinquent, and advertised for sale at public auction, and unless payment is made before will be sold on Monday, the twenty-fourth day of December, 1877, to pay the delinquent assessment, together with costs of advertising and expenses of sale. By order of the Board of Directors.  
J. W. CLARK, Secretary.  
Office, 418 California Street, San Francisco, California.

### Fresno Quicksilver Mining Company.

Location of principal place of business, San Francisco, Cal. Location of works, Mexico, Fresno county, Cal. NOTICE.—There is delinquent upon the following described stock, on account of assessment No. 5, levied on the nineteenth day of September, 1877, the several amounts set opposite the names of the respective shareholders as follows:

Names.	No. Certificate.	No. Shares.	Amount.
Brown, W. E.	239	7000	\$140 00
Brown, W. E.	307	7000	140 00
Friedberg, Chas.	51	300	6 00
Friedberg, Chas.	217	100	2 00
Friedberg, Chas.	399	100	8 00
Haley, John J. trustee.	57	1000	20 00
Haley, John J. trustee.	88	1000	20 00
Haley, John J. trustee.	80	1000	20 00
Haley, John J. trustee.	90	680	13 60
Haley, John J. trustee.	255	4320	86 40
Haley, John J. trustee.	327	7000	140 00
Robinson, E. J.	200	500	10 00
Robinson, E. J.	201	500	10 00
Robinson, E. J.	330	1000	20 00
Robinson, E. J.	329	655	13 10
Robinson, Clara M.	204	25	50
Robinson, Clara M.	322	25	50

And in accordance with law, and an order of the Board of Directors, made on the nineteenth day of September, 1877, so many shares of each parcel of such stock as may be necessary, will be sold at public auction, at the office of the company, 414 California Street, San Francisco, California, on Tuesday, the thirteenth day of November, 1877, at the hour of one o'clock P. M., of said day, to pay said delinquent assessment thereon, together with costs of advertising and expenses of sale. R. WEGENER, Sec'y.  
Office, 414 California Street, San Francisco, Cal.

### Mariposa Land & Mining Company of

California.—Location of principal place of business, San Francisco, California. Location of works, Mariposa County, Cal.

Notice is hereby given that at a meeting of the Board of Directors, held on the twelfth day of September, 1877, an assessment, No. 12, of \$1.00 per share was levied upon the capital stock of the corporation, payable immediately in U. S. currency to the Secretary at the office of the company, room 33, Nevada Block, No. 308 Montgomery street, San Francisco, California, or to the Assistant Secretary, at the office, No. 9 Nassau street, New York, N. Y.

Any stock upon which this assessment shall remain unpaid on the fifteenth day of October, 1877, will be delinquent, and advertised for sale at public auction, and unless payment is made before will be sold on Monday, the twelfth day of November, 1877, to pay the delinquent assessment, together with costs of advertising and expenses of sale. By order of the Board of Directors. LEANDER LEAVITT, Secretary.  
Office, Room 33, Nevada Block, No. 308 Montgomery street, San Francisco, Cal.

POSTPONEMENT.—At a meeting of the Board of Directors of the Mariposa Land and Mining Company of California, held October twelfth, 1877, the day for the sale of stock on the above assessment was postponed until October twenty-ninth, 1877, and the sale day for such delinquent stock was postponed until Monday, November twenty-sixth, 1877.  
LEANDER LEAVITT, Sec'y.

### Merced Mining and Water Company.

Principal place of business, San Francisco, Cal. Location of works, Mormon Bar, Mariposa Co., Cal.

Notice is hereby given that at a meeting of the Board of Directors, held on the second day of October, 1877, an assessment, No. 1,



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RAILROAD AND OTHER IRON

Every Variety of Shafting,  
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Axles and Frames,  
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Hammered Iron of Every Description and Size.  
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Standard sizes of Railroad Car Wheels, with special pat-  
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The Only Illuminating Tile Manufactured for Light-  
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**STEAM ENGINES AND BOILERS**

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Bullion can be forwarded to this Office from any part of  
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Is Extensively Used in the East and

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Wherever introduced, because it can be run with less  
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Cost of Roasting and Chloridizing 20 Tons  
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One man.....	\$ 4 00
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Wood—24 Cords at \$3 per cord.....	5 25
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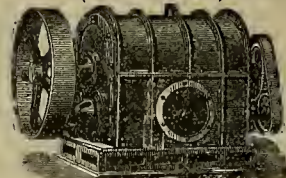
In a furnace of three or four times this capacity the cost  
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It can be adapted to any first-class Gold or Silver mill, at  
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Standard book throughout United States and Canada.  
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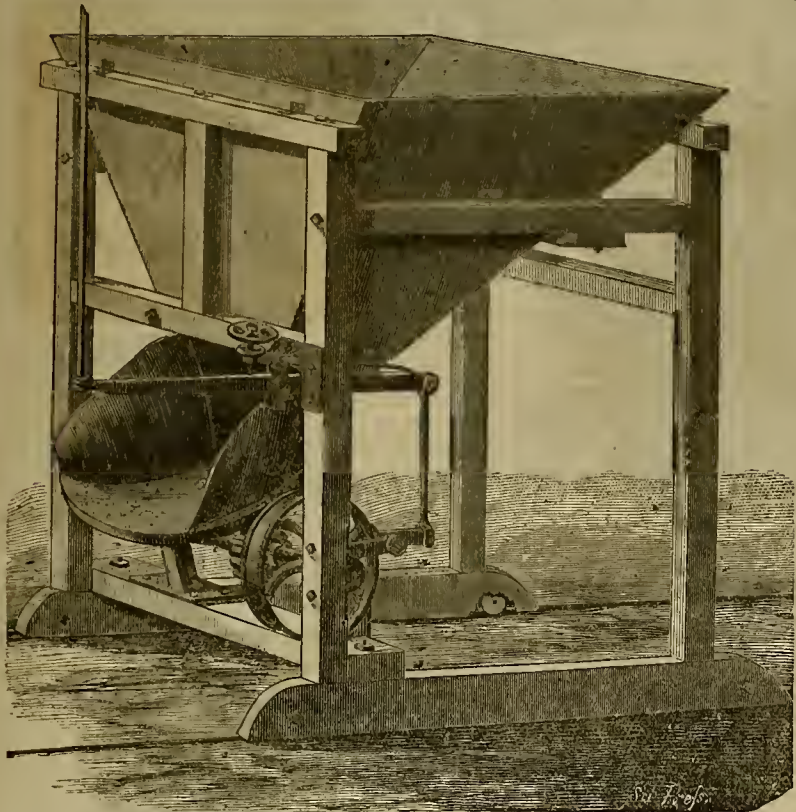
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We warrant the machines to give perfect satisfaction, and to be a better and more durable Feeder than any other the market, and will sell them as cheap as any other of its class.

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O. H. Bogart, 402 Montgomery St., San Francisco, Cal.  
Bardwell, Walter & Co., 408 California St., S. F., Cal.  
Haggis & Tevis, 50 Nevada Block, San Francisco, Cal.  
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Silver King Mining Company, Arizona.  
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The Tulloch Ore-Feeder, after having been in use for about six months in the "Gold Stripe Mine," at Greenville, Plumas County, Cal., has also been superseded by the \$1,000 Challenge Ore Feeder.

## \$1,000 CHALLENGE.

Backward in Coming Forward.—Challenge is Still open. Gentlemen, Put up or Shut up.

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Rubber Hose, Packing & Belting, Wired Suction Hose, Carbolized Hose, Steam Hose.

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We have the best Imitation Gold Watch in the Market for Trading Purposes. The metal is a composition of other metals, as closely resembling gold that the best judges find it difficult to detect the difference, except by a chemical test, and it has the virtues requisite to make it the best substitute for gold known. GENUINE AMERICAN MOVEMENT. EXPANSION BALANCE. BEAUTIFULLY ENGRAVED OR FINEST TURNED HUNTING CASES, and equal in appearance to a GOLD WATCH THAT COSTS FROM \$150 TO \$200. It sells and trades readily for from \$25 to \$100, and if you wish a watch for your own use or to make money on, try this. Owing to our large sales, we are enabled to reduce the price of them to \$12 each with an elegant Chain attached. They are used on Railroads, Steamers, and in Manufactories, and other places where accurate time is required, and gives general satisfaction. We send them by Mail or Express, on receipt of \$12, to any part of the Country, or it will be sent C.O.D. when the customer desires and remits \$2 on account. These ELEGANT CHAINS weigh about Fifty Fourweights, and the same pattern in pure gold would cost \$100. We sell these Chains at \$2 each. But we sell the Watch and Chain for \$12, sent by Mail in a Registered Package, post-paid, to any Post Office in the United States.

WE SELL THE WATCH WITHOUT THE CHAIN FOR \$10.  
J. BRIDE & CO., Clinton Place & No. 11 Eighth Street, N. Y.

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Patent Riveted

Clothing,

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USE NO OTHER, AND INQUIRE FOR THESE GOODS ONLY.

Diamond Drill Co.

The undersigned, owners of LESCHOT'S PATENT for DIAMOND POINTED DRILLS, now brought to the highest state of perfection, are prepared to fill orders for the IMPROVED PROSPECTING AND TUNNELING DRILLS, with or without power, at short notice, and at reduced prices. Abundant testimony furnished of the great economy and successful working of numerous machines in operation in the quartz and gravel mines on this coast. Circulars forwarded, and full information given upon application.

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## CAUTION TO HYDRAULIC MINERS.

All persons, excepting those having the right by purchase from me, are hereby cautioned against using, or making, or selling any device for turning the discharge pipes of hydraulic machines which uses the deflecting force of the stream of water.

Any such device is an infringement of United States Lotter's Patent, granted to me on the 16th of May, 1876, and re-issued September 19th, 1876.

I have commenced suit against Richard Hoskin for infringing my said patent, and intend to prosecute all parties using such Deflectors without license from me, there being no other way to protect my rights.

Any parties wishing to purchase the right to use this device can do so by making application to me.

HENRY C. PERKINS,

North Bloomfield Nevada County, Cal.

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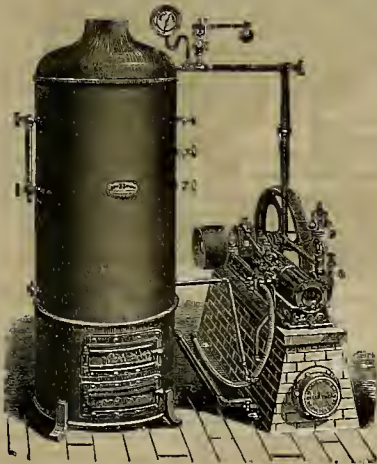
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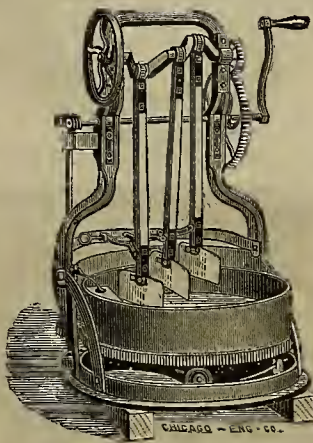
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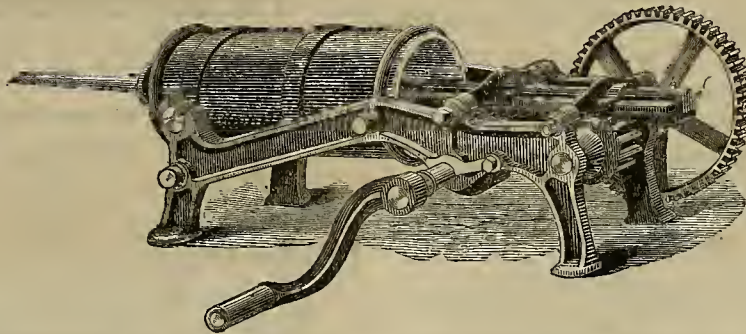
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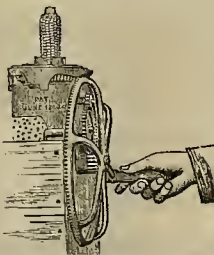


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# MINING AND SCIENTIFIC PRESS.

An Illustrated Journal of Mining, Popular Science and General News.

BY DEWEY & CO.,  
Patent Solicitors.

SAN FRANCISCO, SATURDAY, NOVEMBER 3, 1877.

VOLUME XXXV.  
Number 18.

## The Academy of Sciences and the Lick Trust.

Judge Wheeler, of the 19th District Court has overruled the demurrer to the complaint in the case of R. S. Floyd et al., Trustees, vs. John H. Lick, administrator of James Lick, deceased. In making the decision the Judge said:

"This is a bill in equity filed by the plaintiffs, claiming to be the Trustees of certain trusts created by the late James Lick. The bill prays for a decree of this court, notifying and confirming a certain compromise alleged to have been made between the plaintiff and defendant, John H. Lick, as administrator of James Lick, deceased. The defendants embrace the surviving relatives of James Lick, as well as the respective beneficiaries named in the deed of trust. All parties in interest concur in the propriety of the compromise, except the California Academy of Sciences, which is one of the beneficiaries, and which appears and demurs to the bill.

"It is contended by defendants' counsel that the complaint itself shows that the plaintiffs are not the legally constituted Trustees, with the single exception of R. S. Floyd. To reach a satisfactory conclusion on this point, that is, whether the plaintiffs are Trustees *de jure*, involves an examination and construction of the trust deed of September 21, 1875. By that instrument, five Trustees were appointed, one of whom, the said Floyd, it is admitted, has never resigned nor been removed. By the 21st subdivision of the trust deed, it is declared, among other things, that during the lifetime of James Lick he shall be authorized to demand and receive the resignation of one or all of the Trustees and to fill all vacancies that may occur. Previous to his death the said Lick did demand in due form the resignation of all of the Trustees named in said deed, except that of the said Floyd; and a short time afterward did appoint, in due form, four new Trustees, who accepted the trusts mentioned in said deed, and who are the co-plaintiffs of the said Floyd. I think it is clear that Mr. Lick intended to reserve to himself the power to remove at pleasure any and all of the Trustees, and to appoint others to the places thus made vacant, and that consequently the plaintiffs in this case are Trustees *de jure* as well as *de facto* of the trusts created and declared by the terms of the deed.

"It is further suggested by the defendant that the complaint does not state facts showing that the adverse claim set up by the administrator has any legal force or validity. It is true that the complaint does not admit that the administrator has a good cause of action, but it avers upon various alleged grounds, claimed by the

administrator to exist, he is about to commence legal proceedings which will involve the estate in long and expensive litigation. The very term compromise involves doubt. The complaint shows that the Trustees, as well as all the beneficiaries, except the Academy of Sciences, consider it for the best interests of all concerned to carry out the compromise agreed upon. It is a fundamental rule that courts of equity are disposed to favor the compromise of contested claims. Especially is this true of charities where, upon the whole, the compromise will be more beneficial to the charity than a long and contested litigation.

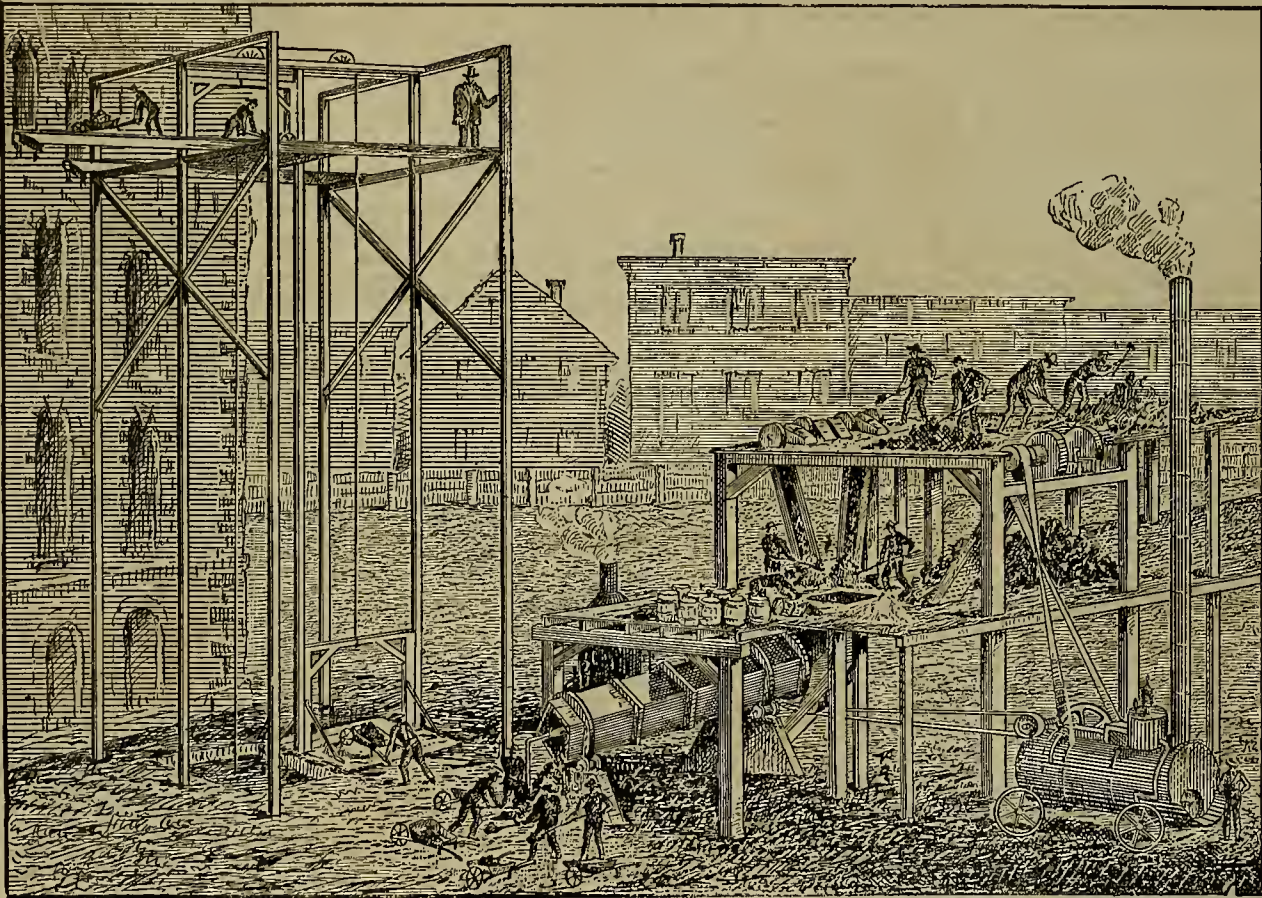
"The value of the estate is alleged to be \$3,300,000. Its very magnitude furnishes the strongest incentives to a long and severe con-

and determine from what fund or funds the amount necessary to effect the compromise shall come. That is really the only question at issue. The Academy is not unwilling to compromise but it objects to giving up its entire share in order to do so. They propose that all the beneficiaries shall give up a certain percentage of each share to effect the compromise, but the Lick Trustees declare they have no right to take anything for the purpose from the specified bequests, but must take it from the balance remaining after the specified bequests are paid. The Academy and Pioneers being residuary legatees, as it were, the money is to be taken from them alone. As implied in the concluding sentence of the above decision the Court is by no means positive on this ground, and the state-

## Making Concrete Work.

We illustrate herewith the method adopted in mixing concrete for the arches and floors of the New City Hall, which was supplied by E. L. Ransome. It is the first time the mechanical mixing of concrete has been tried in this city. On the platform is one large and two small rock breakers, which are fed by four men. The platform is 18 feet high, and as the rock leaves the rock-breakers it falls on screens to a lower platform. This platform is at the upper end of a mixer, as shown, and here the rock, sand and cement are supplied in proper quantities. Eight men supply the material to the mixer. The feed is continuous. The material is mixed dry in the upper part of the mixer which is 16 feet long. The lower part contains an inch perforated pipe which, by means of a valve, supplies the necessary amount of water to the concrete. At the discharge end are five men to fill the iron wheelbarrows as rapidly as the concrete comes from the mixer, and they wheel it to the double elevator which stands by the building.

This elevator is worked by one of Hawkins & Cantrell's link-motion hoisting engines. The elevator carries two full wheelbarrows up and two empty ones down. Mr. Riley, who worked the apparatus, says they could elevate 130 barrows an hour, and he has elevated 175 in an hour, 34 feet high, to the upper floor of the City Hall. Five men were employed to take the concrete from the elevator to the corrugated iron arches.



MECHANICAL PREPARATION OF CONCRETE AT THE NEW CITY HALL.

test, and if a compromise be not effected, half a lifetime may be consumed before the numerous beneficiaries can taste the fruits designed for their immediate enjoyment by the munificence of the donor. Upon a final hearing, the court will consider, with due care, the grounds of the compromise, and will also protect by its decree the respective beneficiaries, as well as determine from what fund or funds the amount necessary to effectuate the compromise shall be drawn."

Now, although on the face of it this decision seems to be adverse to the Academy of Sciences, it is favorable to them, as it is also to the prospects of the whole matter being amicably settled. It being established that the present Board of Trustees is the proper one, that settles any doubt as to their being able to carry out the requirements of the deed without further delay. The fact that a compromise will be possible and that it is best for all parties is also established. But the important point, and the one which the Academy specially desires, is the admission by the court that this compromise is possible without it being absolutely necessary for the Academy and Pioneers to pay the amount of the compromise from their shares. The Court says it will protect the beneficiaries

ment that the respective beneficiaries will be protected in a final hearing, is sufficient basis for believing that the Judge understands the question properly, and will not see the Academy and Pioneers lose their share because the matter must be compromised. Therefore, while the decision is favorable to the more rapid settlement of the present difficulty it is also favorable to the proposition of the Academy of Sciences, that all those to be benefited by the compromise should bear their share of the expenses.

**NORTH PACIFIC COAST RAILROAD.**—The North Pacific Coast railroad was completed in May last and the first train crossed Russian river on the 21st of that month. The earnings for the five months ending September 30th, aggregated \$186,039.69, and the expenses were \$110,437.25, leaving a balance of net earnings of \$74,602.44. The road has not enough rolling stock to do its business. There are over 5,000,000 feet of lumber, 15,000 cords of wood, 2,000 cords of hark, over 100,000 sacks of potatoes and thousands of sacks of charcoal awaiting transportation. The company expects to provide greater facilities by spring, having ordered three new locomotives.

They were enabled to put in by the aid of this machinery, a yard of concrete in 20 minutes. That is, they loaded the rock in the City Hall yard, crushed and screened it, and mixed it with cement, sand and water, loaded it in the barrows, elevated, wheeled and put it in place at the rate of a yard of concrete in 20 minutes.

This was the most complete machinery for the purpose ever put up on this coast. The machinery was all made here. The hoisting engines by Hawkins & Cantrell; the portable engine that worked the crusher and mixer by H. W. Rice; the large rock breaker by Varney & Rix at the Miners' foundry, and the two small breakers by Wheeler. The mixer is new to this coast, all work of this kind having formerly been done by hand. Mr. E. L. Ransome, the contractor, made the mixer. J. W. Riley superintended the work of putting up the machinery, elevators, etc., as shown in our illustration; also the concreting of the iron arches, etc.

Experience has shown in the operation of this mixer at the New City Hall, that by its use a great saving is made over mixing by hand labor. The machine work is so thorough that it makes an equally good concrete with a much less quantity of cement.



## CORRESPONDENCE.

It is the desire of the editors of this journal to be liberal toward all correspondents, and therefore statements and opinions are frequently published, on the authority of the writers, for which we do not assume responsibility.

### Notes from Tuolumne County.

EDITORS PRESS.—The 4th inst. I saw a little more of mining in Tuolumne county. Mr. P. Easton, who lives near Cherokee, has two valuable mines; one of these is a sulphur vein; from the other assays have been made at different times. One by Mr. T. C. Clark gave \$600 per ton. Mr. Bussie made three assays: the first gave \$300 per ton; the second, \$400; the third, \$500.

Mr. Easton is confident this is a very rich bank, but he has not the necessary capital to develop it.

I also visited the Fowels mine, owned by Mr. Fowels, in the same vicinity, and I saw beautiful rock which he is taking out of the shaft he is sinking, below the 50-foot level. The morning of the 5th, as I passed through Jack-souville, river mining was the only industry which attracted my attention, and, as far as I could learn, it is not very profitable this season.

I arrived in Groveland in the evening, where I was entertained by M. J. J. Dupratt, who is Superintendent of the Nonpareil mine. The next morning I visited the mines, Two Brothers, No Name and Nonpareil. The first two have given good prospects. The latter has been worked quite extensively, and promises good; and there was the nearest ten-stamp mill I ever saw. It is at the mouth of the tunnel, which saves handling the ore. The tunnel is 950 feet in length, 750 feet in a straight line, the remainder at a right angle, and forms the 340-foot level, drifting eastward and upward with a vein full three feet thick. The tunnel also cuts a parallel vein which is 24 inches in width and shows beautiful ore.

On our way back Mr. Dupratt showed me the Italian mine, which is near the others. This mine is owned by five Italians, gives a ten-stamp mill work, and is paying well. Owing to the water having failed, I could only see these mills idle, but all interested parties are waiting for the wet season to begin.

I have been over the greater part of Tuolumne county and endeavored to glean information from reliable sources. Placing that with my own judgment, I believe that this county will yet be a field in which capitalists will seek to invest their money in real mines. She has mines which are not a myth, but are those which are yielding wages to the owners, who bring the ore out in buckets and crush it in hand mortars. If it pays these poor men to thus work, who have not the means to put up the necessary machinery, will it not pay the money powers to develop these mines; and wield their capital and strength in that which is legitimate instead of gambling in stocks? Stock mining has been the curse of Tuolumne county's quartz mines. But now the people see the necessity of having their mines worked on an honest basis. There are mines in this county which are being worked in this way, and they are the ones which are paying the dividends.

The marble and limestone quarries are no small item in the wealth of this county. There are mountains of marble, and yet little progress is made. When honest stock companies are formed to bring out the hidden treasures contained in the mountains of Tuolumne county, then the working people will rejoice.

R. A. E.

### A Settlement of Charcoal Burners.

The charcoal burners of Pine Nut valley are now marketing the product of their last year's labor. They find ready sale on the Comstock range for all the coal they can produce, and at good prices. Pine Nut valley is distant from this city 35 miles, in a southeast direction. The road to the valley is said to be a very rough one, and to make a trip to this city with a four-horse team and load of coal is said to occupy four days.

During the past summer the amount of charcoal produced in the valley was from 150,000 to 200,000 bushels. This is stated to be a falling off from the product of last year.

There are at present about 80 men at work cutting wood, hauling it together and burning it into coal. In the winter more men are employed than in the summer, as it is in winter that the wood is cut. There is so little snow in the valley that it does not interfere with wood cutting. In the summer the wood is hauled, made into pits and burned.

It is said that there is an abundance of wood in that region for years to come—the groves of nut pine stretching away to the southward many miles. Only a small portion of this wood land is claimed and it is said that there is plenty of room for men who wish to go into the business of charcoal burning. The men now in the valley are anxious for an extension of the railroad in their direction. It would seem that there is a chance for men who are out of employment to find something to do in the valley in the way of cutting wood or burning coal, either for others or on their own account.—*Virginia Enterprise*.

### Meadow Lake.

A correspondent of the *Virginia Enterprise* sends the following items from Meadow Lake: Straying away from the Comstock some two weeks since, I headed for Meadow Lake. From Truckee to Webber lake by stage, then a solid ten-mile walk to the once famous mining camp, now nearly deserted. What a pitiful change from 10 years since! I was one among the thousands who came rushing in here pell-mell at a "240 gait" in 1865, and became immediately wealthy (in my imagination), and among those who a few months later, walked away from here without a cent in my pocket.

What was formerly the principal business portion of the town was destroyed by fire some four years ago, supposedly an "accident," brought about by the assistance of an uncertain "homie" resident here at the time. At present there are some 10 men here engaged in mining, that is, doing the usual work required to keep good the titles from year to year. Among those I have met there is one thoroughly practical miner, a Comstock hoy, J. A. Glenn, who is the owner of some of the best mines in the district, and, what is to his credit, knows to a dollar what the ore he has on the dump will go to the ton, and also the average of nearly every mine in the district. He is in fact, a self-taught, thoroughly practical man, and a good average assayer. He came here three years since, at the time the "Fryer process" was up to a white heat, thinking there was "millions" in Meakow Lake, provided Fryer could do one-half he talked. Having a good assayer's outfit, he set to work to ascertain what the resources of the district were. After repeated trials and "successful failures" of all sorts of processes he applied himself to working out a way to treat Meadow Lake ores in a practical manner.

The majority of the ores being low grade, a cheap mode of reduction must be had. After making repeated tests by all the different processes known, from smelting to lixiviation, he finally became convinced that thorough oxidation must first take place, then, of course, amalgamation must follow, as a part of the true process.

As a favor to me Mr. Glenn worked 10 pounds by way of demonstrating the principles he professes to operate on. The ore is first dumped on to a drying hearth, or run through a calcining furnace; from there it goes to the batteries, or a Storey pulverizer. The pulp is then treated and introduced to the oxidizing furnace, from which it is raked into wooden vats containing an alkaline bath, from which it is shoveled into improved arastras for future pulverization and amalgamation. Amalgamation has always been the stumbling block, the gold being of the character known as flour gold, being incased in a delicate film, or gas, which causes the mercury to turn away from it as if sick.

Mr. G. introduces a compound of his own invention which causes instant amalgamation, reviving the mercury and preventing flouring, working the ore up to 80%, of assay, at a cost of \$6.64 per ton. I can but pronounce the process entire a good one; practical as well as simple, and it really seems as if there must be a healthy reaction in this almost worn out district ere many months. I doubt not but many an old Meadow Laker will wish Mr. G. every success in his undertaking.

### Luck in an Old Mine.

The *Placer Herald* says: A year ago last May, Mr. S. A. Shurtliff, an energetic miner of Ophir, commenced work in an old lead on Duncan hill, to the right of the road leading from Auburn to Ophir. Of course that simple fact neither attracted attention nor created comment, but when in October following, about a year ago, he struck ore so rich that a few tons thereof yielded him \$6,000, Shurtliff's luck became the subject of most everybody's conversation. Few, however, supposed his strike was anything more than a pocket, and hence with the first sensation the matter passed off, and little has been heard or said of the result of Mr. Shurtliff's proceeding since. All in that neighborhood know he has in a modest way kept steadily at work, but outsiders not anticipating much, few have bothered themselves to become acquainted with the result. On inquiry, however, we learn from Mr. Shurtliff that from the time of his first strike all the rock taken out has paid him well. From the main shaft, which he sunk to the depth of 160 odd feet some time ago, and there rested, he has run a drift on the 105-foot level, connecting with an air shaft 75 feet distant; also on the 155-foot level he had drifted 30 feet from the main shaft each way along the lead. From the 105-foot level, and between the main shaft and the air shaft, he has stoped out the rock to within about 40 feet of the surface; he has also stoped considerably from both sides of the main shaft above the 155-foot level. The ore from these stopes indicates very thoroughly the character of the ledge to the depth he has gone, and when it is known that this ore has yielded an average of about \$40 per ton, we must conclude that the ledge, which has an average width of two feet, is a good one. But all this, encouraging as it is to the owner of the mine and the district in which the mine is situated, is not the best. Last Saturday, Mr. Shurtliff commenced work again on the main shaft, desiring to prospect his mine still deeper, and on Monday he was taking out quartz from the very bottom, not second to the best the mine

has ever produced. In color it is a dark, irregular blue, heavily sulphureted, and in some instances fairly speckled with free gold. From indications its yield will run into the hundreds of dollars per ton. This can be safely termed a good mine, as from nearly the top down it has not only prospected well, but has panned out well all the way, and the rock is richest as well as most favorable in character at the bottom. Mr. Shurtliff contemplates running a tunnel in the near future in the sides of the hill along the vein that will tap the main shaft at a depth of between 300 and 400 feet, and erecting a five stamp mill at the mouth for his own use. The mine has remunerated its owner handsomely already, but with these additional facilities for working it, at its present average yield even, the property would certainly be very valuable.

### The Bonanza Mines.

Below will be found a trial balance of the financial operations of the bonanza mines for the first three-quarters of the current fiscal year. That of the California is as follows:

Receipts.	
Bullion on hand, annual statement.....	\$1,342,967.93
Cash on hand, San Francisco, annual statement.....	1,054.56
Cash on hand, Virginia, annual statement.....	381.14
Samples on hand, Virginia, annual statement.....	2,228.68
Gross product of mine to October.....	13,963,567.07
Ore sales.....	12,704.07
Present overdraft Nevada Bank.....	975,388.80
Total.....	\$16,298,205.79

Disbursements.	
Overdraft Nevada Bank, annual statement.....	\$339,637.62
Dividends, 9th to 18th inclusive.....	10,300,000.00
Reduction of ore.....	1,694,562.50
Discount on bullion.....	707,254.43
Refining.....	144,540.77
Salaries and wages.....	558,565.00
Taxes.....	351,582.27
Supplies.....	208,874.00
Hoisting.....	132,181.79
C. & C. shaft.....	116,000.00
Legal expense.....	101,643.76
Interest and exchange.....	50,084.33
Bullion freight.....	52,640.00
Assaying.....	42,422.05
Surveying.....	900.00
San Francisco office expense.....	2,834.08
Books and stationery.....	1,156.00
Advertising and printing.....	277.00
Virginia office expense.....	2,300.73
Cash on hand in Virginia.....	1,072.71
Cash on hand in San Francisco.....	1,100.50
Samples on hand.....	1,430.72
Gold bullion on hand.....	418,698.85
Silver bullion on hand.....	651,631.70
Total.....	\$16,298,205.79

Bullion amounting to \$586,831.27 received on October account is not included in the above statement.

C. P. GORDON, Secretary.

Following is the third quarterly statement of the receipts and disbursements of the Con. Virginia mining company for the current year ending October 15, 1877:

Receipts.	
Gross product.....	\$9,469,562.40
Ore sales.....	68,201.38
Nevada Bank overdraft.....	1,300,030.11
Bullion samples.....	1,223.08
Assay.....	45,723.08
Balances last annual meeting.....	35,012.70
Hoisting.....	5,253.07
Total.....	\$16,920,006.10

Disbursements.	
Jas. G. Fair, Superintendent's acct.....	\$7,437.38
Bullion on hand unsold.....	1,434,236.61
Cash.....	2,600.20
Virginia office.....	4,192.83
Ore purchase.....	80,865.45
Freight.....	55
Survey.....	500.00
Assay office.....	20,048.84
Books and stationery.....	750.50
Legal expense.....	24,255.71
Advertising.....	146.56
Water.....	5,000.00
Real estate.....	1,652.00
Taxes.....	184,012.04
Reduction.....	1,071,709.69
Interest and exchange.....	50,084.17
Bullion freight.....	32,614.44
Dividends.....	6,480,000.00
C. & C. shaft.....	116,000.00
Bullion discount.....	900,582.03
Supplies.....	307,122.04
Salaries and wages.....	487,931.50
Expense.....	3,908.80
Total.....	\$10,920,006.10

H. W. HAYES, Secretary.

THE AMALGAMATION IMPROVEMENTS.—The experiments in amalgamation now being prosecuted at the Manhattan mill, by C. A. Stetefeldt, are not with a view to increasing the result of the process in metal, but for the purpose of reducing the time required for amalgamation. The process in use at the mill is as perfect as the best known appliances can make it, so far as yield and close working are concerned, but the aim is to effect a saving in time, labor, and wear and tear of machinery, by producing the same results in a less space of time. Mr. Stetefeldt informs us that his tests and experiments have so far progressed satisfactorily, and that he is confident of ultimately obtaining the desired result. The various departments of the Manhattan mill are at present so evenly balanced that no one of them can do more work than the other can take up and perform in regular course, and at the same time it takes all the capacity of one to keep the other supplied. Thus, the capacity of the furnace is to roast just the amount of ore that the batteries can crush, and that of the batteries is exactly equal to that of the pans. By increasing the amalgamating capacity, without adding to the number of the pans, the company would at such time as it might be necessary be enabled to put in additional stamps in the mill without the necessity of increased power to run them.—*Reese River Reville*.

### The Monterey Coal Mine.

The *Castroville Argus* says: Arrived at the head of the canyon, over a road laid with broken granite, we ascend the hill by an easy grade and reach at the top the end of the wagon road. Below, near the base of the hill, are two small buildings, one used by the men employed at the mine as a kitchen and dining-room and the other as a lodging house. We descended the hill and were very kindly received by Mr. Sherman, the gentleman in charge, who, after inviting us to an excellent lunch, to which we did full justice, conducted us through the different tunnels and gave us information upon matters generally about the mine.

The company now in charge is the second in possession, having acquired the mine at the sale of the entire property, which some of the stockholders of the first company have been threatening to contest. One of the tunnels, about 60 feet in length, was made by the old company; coal was struck here in considerable quantity, but when the new company took charge a second tunnel was cut farther down the hill, this being in length, together with the drifts, 130 feet. There is here a four-foot vein of coal of high quality, and about one-third the distance up the hill an incline has been sunk about 50 feet, through which, also, good coal has been brought up. Other smaller excavations have been made on the southerly side of the hill with similar success, and now the work of tunneling on the northerly side is going on. Should this work result satisfactorily, the coal could be sent down the canyon, over a tramroad, to the shipping point selected, a cove on the other side of and not far distant from Point Lobos, the distance from the mine being about two and one-half miles. Otherwise the coal will have to be taken up by steam power from the southerly side to the top of the hill, going forward from there over a tramroad, through the canyon.

The Monterey blacksmiths speak highly of the quality of the coal, which has been thoroughly tested by them. It is bituminous and for their purposes far superior to Mt. Diablo or Coos hay coal. The company believe the deposits are large, and therefore will push the work of development with all practicable speed.

### Murchie Mine.

The property known as the Murchie mine consists of several ledges and a hydraulic gravel claim. The ledges now being worked are the Independent and Big Blue ledges. There is a tunnel being run on the Lone Star ledge for the purpose of development, but no rock is being taken out at the present time. The property is now owned by a stock company, the Murchies retaining an interest. There is an eight-stamp mill in operation and the machinery for a ten-stamp mill on the ground, which will be put up shortly. The hoisting works are new and complete. The new company have opened up the old shafts and drifts and are now taking out rock while running on new drifts on the Independent and Big Blue and the ledges are showing equal to anything ever seen in this district. The Big Blue ledge is five feet in width and the rock is filled with heavy sulphurets and free gold and it is estimated by good judges will average at least \$25 per ton in free gold. The Independent ledge is about a foot in width and is richer than ever. It will yield \$60 per ton as has been demonstrated by several crushings. The poorest lots have paid \$49 and the highest yield was \$83 per ton. On Monday last we made a visit to the mine in company with some experienced miners, each one of whom declared that the prospects of the mine are very brilliant, and it is confidently believed that the property will, in a short time be generally regarded the best in this section. As soon as the two ledges now being worked upon are well opened; the work of development on the other ledges will be pushed ahead, and a large force of men put on. Although the Murchie mine has been under a bond, it is now giving proof of what it is worth. The success of the owners will be hailed with joy by the whole community.—*Nevada Gazette*.

THE BLACK HILLS.—The mining market is showing an improved appearance. Scarcely a day passes that we do not chronicle the sale of a mine or mill site at good figures. California capitalists have found their way into the Hills, and purchased the Home Stake No. 1, which is at present yielding 150 tons of ore per day. Eastern capitalists are also looking about for their share of the golden harvest, and, fortunately for our future prosperity, with flattering results. Not a single stamp of the 350 is idle, while many a dump groans under its load of rich quartz, waiting for a chance to make a week's run. The furnace at Bear Buttes started up a few days since, and proved a grand success, which the boys celebrated with a great ovation, and several were leaded in strict accordance with Eureka principles. The managers of the smelter pronounce the ore to be without a rebellious feature. This camp, like Deadwood, contains an unlimited amount of low grade ores. Our agricultural resources may have been overestimated in some regards. A portion of the crop has proved a failure, owing to the shortness of the season and lack of proper irrigating facilities. This last evil can, of course, be remedied, and, perhaps, when fully developed, may equal the expectations of the most sanguine.—*Eureka Sentinel*.



## MECHANICAL PROGRESS.

## American Recuperative Power.

The way in which American industry resumes its activity after great reverses is a wonder to European observers. The latest occasion for surprise in their minds is the return of railway activity after the recent serious riots in the Eastern States. The *London Colliery Guardian* gives us credit for doing what no other people could do. It says:

The Americans have an awkward fashion of drifting into labor and other difficulties, but no people have a happier knack of extricating themselves from the embarrassments to which they may be reduced in consequence. The ups and downs of American business life are certainly marvelous. It is only two months since the attention of the civilized world was devoted to a terrible conflict between labor and capital, which appeared to be shaking the commercial interests of Pennsylvania to their very center. Two months ago we were computing how many locomotives had been destroyed at Pittsburgh by mob-enkindled flames, and we were vaguely wondering who was to make good the thousands and thousands of dollars sacrificed in saturation as wild and reckless as they were senseless and unintelligible. Yet we learn that lately the Philadelphia and Reading Railroad Company has been doing something very like a roaring coal trade. Thus, in the week ending September 1st, this important company carried 178,000 tons of coal, against 64,000 tons only carried in the corresponding week of 1876. It is true that the Philadelphia and Reading Railroad was not so much a prey, in July, to mob violence as its neighbor, the Pennsylvania; nevertheless, all business interests in Pennsylvania must hang more or less together, and the rapid revival in the coal traffic of the Pennsylvania and Reading system, appears to us a marvelous circumstance, and one which would not be witnessed in any other country but the United States.

BRITISH PATENTS IN 1876.—Our London exchange, *Iron*, gives some notes of progress in the British Patent Office: During 1876 the number of applications for letters patent was 5,069, of which 1,702 were snuffed to lapse, leaving 3,367 in force after the first six months. The number of applications in 1875 was 4,561, so that there was an increase of 500, a fact unexampled in the official records. For some years there has been a steady growth, the increase of 1875 being 69, that of 1874 being 193. A calculation over all the years since the act of 1852 shows that only 28% of the patents pay the third year's fees and live for seven years, while only 10% survive the full term of 14 years by paying £50 at the end of seven years. As far as can be calculated from the statistics given, there are now, or rather were at the beginning of the year, just 14,440 patents (neglecting new and unpublished applications) in force out of the 84,114 applications since 1852. The total receipts of the Patent Office in 1876 were £185,371, of which £139,067 was profit. The patents, trade-marks and designs departments have been united. It appears that the aggregate surplus income since 1857 amounts to about a million and a half. In the Designs Registry 9,176 ornamental designs were registered, and a small number of "useful designs." The fees in this department amounted to £4,738. The Trade Marks Registry makes a first appearance in this year's report of the Commissioners of Patents. Out of the 3,698 applications lodged on behalf of 10,384 marks by the end of the year, only 261 were registered by that time, but 4,984 marks had been registered by the 31st of July. Inasmuch as by the act only those trade-marks can be protected by legal process which are actually registered, the position of the other 5,400 marks may possibly raise some nice points in future actions for infringement. The fees received on account of the Trade Marks Registry amounted to £8,295. It appears that the classified abridgements of patent specifications are again to be proceeded with.

USING BOTH ENDS OF A LATHE SCREW.—Prof. John Sweet, of the Cornell University Mechanical School, makes the following note in the *Polytechnic*: As to the wearing of the lead-screws out of pitch, this occurs from the fact that the screw is in ordinary practice used a great deal more in one part of the lathe than others. The only remedy I know of being carried out to help this is in the Ferris & Miles lathes, where they make the lead-screw reversible, so that when one end is worn they can change it. If a user of their lathe should use proper care, he might maintain a reliable screw for a long time. By always using the screw, one end for cutting standard lead-screws, and the other for indifferent work, it would then maintain its truth much longer. Were it possible to determine in advance the relative proportion of times a screw is used along the different portions of its entire length, then a method could be adopted that would maintain a uniformity of wear. If a lathe were used only one-twentieth part as much at the foot-stock end as at the head, then cutting out nine out of every ten of the threads on the screw at the foot-stock end, and so proportionately eight out of nine, seven out of eight, six out of seven, etc., down to one out of two, perhaps, bringing the wearing area of the threads into some sort of proportion with the wear that comes upon them; then there

would be at least a greater uniformity maintained than at present, if not an absolutely perfect one. But it takes a good deal of courage or faith, or something that but few men possess, to put a nicely finished perfect screw in a lathe, and turn off two-thirds or three-quarters of the thread, and convince one's self, or other people, at least, that one is doing a good thing.

TESTING HEMP-PACKED CAR WHEELS.—An interesting test by hydraulic pressure, says the *Railway World*, was recently made at the Harlem railroad machine shops, in the presence of a large number of railroad men, upon two of the Atwood steel-tire railway wheels, the peculiarity of which is that the tire is held to its place upon the center by a packing of hemp, dispensing entirely with bolts or rivets. For the purpose of experiment, a wheel which had run 40,000 miles, the tire of which showed signs of being slightly loose, was first selected. The experiment was to show that although a tire may work loose it cannot come off, the hemp packing interlocking and securing it beyond the possibility of an accident. The pressure being applied, the tire was seen to start at a pressure of three tons. The pressure being increased up to 24 1-8 tons, caused the wrought iron ring, which is simply used to cover the opening through which the packing is inserted, to spring off. When the pressure was further carried up to 50 1-5 tons it caused the tire to move off two and three-fourths inches (about half way off), but still left it firmly fixed to the center. As a second experiment, a wheel was selected which had also run 40,000 miles, in sound condition. To this a pressure of 63 7-8 tons was applied, when the tire showed indications of moving less than one-sixteenth of an inch. It was not thought necessary to carry the experiments any further, the demonstration being perfect that tires secured in this way are safe beyond all contingencies.

EFFECT OF PERCUSSION ON IRON AND STEEL.—A number of English engineers have been making tests with a view to elucidate the conditions of iron and steel when subjected to percussive strains in contradistinction to the application of steady mechanical force. Square pieces of iron and steel boiler plates were used for the purpose, the former being 7-16 inches thick, and the latter three-eighths inches, in a charge of 1½ pounds of gun cotton being used in each experiment. Each plate was laid over a basin-like cavity in the top of a large block of iron, and the gun cotton was exploded over the center, at a height of about nine inches. The result of the experiments showed that the mild steel plates of the Siemens and Bessemer processes, tempered in oil, possess an endurance and ductility far beyond what have ever characterized British wrought irons, and that steel is much superior to iron for the manufacture of boilers, locomotive tires or rails. The annealing process was shown to be clearly advantageous for steel, but so far as iron is concerned the experiments were not conclusive. It is intended that the plates upon which the experiments were made shall be subjected to a chemical analysis, and also photographed.

LIGHT IN RAILWAY CARS.—The *Railway Age* pleads for light in our railway cars, and more especially, the season of early darkness has now set in and the need of which we speak is daily growing more apparent. In those composing the suburban trains whose passengers do not take their daily ride for pleasure, but simply to reach business or home as comfortably as possible. It is now too late, to say that railway cars cannot be well lighted. In the modern Pullman cars, and in the ordinary coaches of some of our roads, lamps suspended in the ceiling, with porcelain shades or burnished reflectors, diffuse throughout a mild, clear light by which the finest type can be read with ease. In cars thus lighted cheerfulness and good humor prevail, and in reading or in animated converse the trip appears short, and the travelers leave the train with a warm and grateful feeling toward the liberal management that has done so much for their comfort. On the other hand 50 or 60 people sitting in a car lighted only by the ghastly reflection from three candles—as may be seen on several of our roads—become a silent, discontented crowd, almost dangerous to accost by the dim, irreligious light of the dip.

ELECTRIC LIGHT IN WORKSHOPS.—The *Manufacturer and Builder* gives some figures concerning the cost of employing electric light to illuminate workshops, etc. We quote a paragraph: The expense of the electric light is given as follows: The cost of a machine with lamp, giving light equal to 500 Carcel jets, is about \$450, and this will represent from 50 to 70 gas jets, according to circumstances. The power required is equal to two-horse steam power, and the cost of the carbon points, as already stated, is four cents per hour for each lamp. When the power is that of water the cost is inconsiderable, and when that of coal has to be taken into account for the steam-engine, it amounts to four cents per hour, bringing the total up to eight cents per hour, and lubrication is set down at about one-half cent more, while the wear of the machinery is regarded as nil. Taking for basis that an electric lamp only replaces the minimum number of gas jets, namely, 50, it is seven times cheaper than gas, motive power not included, and four times cheaper, taking the cost of driving as estimated above,

## SCIENTIFIC PROGRESS.

## Bees Distinguishing Colors.

In a lecture delivered by Sir John Lubbock, the well-known English naturalist, we read of some interesting experiments made to test the ability of bees to distinguish colors. He said he had taught a bee to come to a certain place for honey, and he had then placed a quantity of honey on some blue paper. He allowed the bee to come to this honey several times, and he then placed some more honey on a piece of orange-colored substance. During the absence of the bee on one occasion he took advantage of the opportunity and shifted the position of the two lots of honey. The bee came as usual to the spot where the blue paper had formerly been placed, and stood as if in doubt near the orange-colored substance, and then it dashed over to the blue paper and commenced feeding from it as usual. The lecturer said he had experimented with a variety of colors and found it always the case; if they used a bee to take honey from a certain color it would always select that color from among others. It was fortunate for them the bees enjoyed the same colors and liked the same smells as they did, as there were certain flowers that were fertilized by flies, who preferred livid yellow, dingy red, and very unpleasant smelling flowers, and they were invariably accompanied by a very disagreeable odor. Therefore, if the majority of flowers were fertilized by flies they would find that their gardens lost many of their present charms.

THE FORMATION OF VEINS.—Meunier has communicated to the French Academy of Sciences some observations on the formation of mineral veins, based on the fact that the native sulphides effect the reduction of metals from their solutions. Galena placed in a solution of chloride of gold is at once covered with gilding, and in a solution of nitrate of silver arborescent growths are formed. Other sulphides, including those which are most commonly associated in veins, iron and copper pyrites, blende, cinabar, stibene, and even the sulphide of soda found in mineral waters, produce similar effects. Nor is the action confined to the sulphides. Some selenides, antimonides, arsenides and tellurides also behave in the same way. Meunier therefore points out that if sea water, which always contains silver, filters into a vein of galena, all the silver will be reduced and concentrated in the vein, and this action explains the presence of the native silver so often found in galena. When this has taken place, and the liberated sulphur does not recombine with the silver, we have the super-sulphureted galena, sometimes so rich as to take fire in a flame. But commonly the silver is ultimately transformed into a sulphide.

NEW MINERALS.—In a most interesting communication "On Some Tellurium and Vanadium Minerals," made to the American Philosophical Society by Dr. F. A. Genth, he announces the discovery of the following new species: Magnolite, a product of the oxidation of Coloradoite, (telluride of mercury). It occurs very rarely with native mercury in the upper decomposed portion of the Keystone mine, Boulder county, Colorado, associated with quartz, limestone and psilomelane. It crystallizes in fine needles, color white, luster silky. Readily soluble in very dilute nitric acid and in hydrochloric acid. Composition, mercurous tellurate. ( $Hg_2 TeO_4$ ). Ferrotellurite occurs at Keystone mine, (as above), associated with native tellurium, tellurite and a peculiar iron sulphide, in which a part of the iron is replaced by tellurium. Composition (probably), ferrous tellurite ( $Fe TeO_4$ ). It forms a crystalline coating on quartz, resembling delicately radiating tufts, or when in cavities, very minute prismatic crystals, between straw and cream yellow, or inclining to greenish. Insoluble in ammonia, soluble in hydrochloric acid.

WHY FLOWERS HAVE DIFFERENT HOURS FOR BLOOMING.—Sir John Lubbock alludes to the fact that at certain particular hours flowers close. This habit of going to sleep is very curious, and different flowers keep different hours. The reason for it, however, is obvious, for flowers which are fertilized by moths and other night-flying insects would derive no advantage by being open by day, and on the other hand, those fertilized by bees would gain nothing by being open at night. The closing of flowers, he believes, has reference to the habits of insects, and it must be confessed that the opening and closing of flowers is gradual, and that the hours vary greatly according to circumstances.

FOUNTAINS OF NAPHTHA.—In the neighborhood of Baku, Transcaucasia, says the *English Mechanic*, there seems to be an almost endless supply of naphtha. In many cases naphtha fountains rise in summer 100 feet, and the liquid mostly flows away unutilized, as these large quantities cannot be collected. In the year 1874 there were, at Baku, 180 works in action, many of the smaller of which, however, have been stopped under the pressure of competition of the American petroleum. With better means of transport the Baku petroleum could readily compete with the American product. The largest manufactories are at Surakh Khana, where the gases streaming from the earth are used as fuel.

A DELICATE PENDULUM.—We read that there is now in operation in the laboratory of the Central University, Richmond, Ky., an interesting apparatus that records in a beautiful manner the motion of the earth in its hourly progress through space. It is the invention of Prof. T. W. Toolin. The principle upon which the instrument is formed is that a delicately constructed pendulum will continue to oscillate in the same direction as started, and preserving that plane, mark the motion of the earth beneath it. The principle was demonstrated by Foucault, a French philosopher, in 1851; was verified in Boston, at the Bunker Hill monument, and again at Yale College. The apparatus hitherto employed has been cumbersome, and the results obtained somewhat vague. The experiments, nevertheless, bear historical interest, and are related in modern text books on physics. It has devolved on Kentucky to furnish the scientific world with a finished and mathematical demonstration of the beautiful phenomenon, together with the apparatus for producing the results so as to be proved in a school room or laboratory. The instrument is about six feet high, consisting of an iron tripod and delicate pendulum. There is an index attached to the upper portion of the pendulum, and when the pendulum is started this is perfectly still. In six minutes the earth's motion becomes apparent, and the needle shows about one degree of deviation. In one hour the movement is so marked that the distance traversed by the earth may be estimated from its data. The pendulum is of such delicate construction that it will remain in motion for 12 hours, and yet may be retarded, or even stopped, by blowing upon it.

DETECTION OF ADULTERATION IN BEESWAX.—The *Druggist Circular* alludes to the fact that beeswax has been of late frequently found adulterated with resin. The usual mode of detecting the fraud is to heat the product until it begins to smoke, when the smell of resin becomes distinctly perceptible. A more accurate method is proposed by E. Schmidt, which is claimed to rapidly show the presence of even relatively small proportions of resin. About one drachm of the wax is heated in a flask with four or five times its weight of ordinary nitric acid of sp. gr. 1.31 to 1.33, until it boils, and is kept boiling for a minute; then an equal volume of cold water is added, and lastly, enough of ammonia cautiously poured in to cause the liquid to smell strongly of the reagent. The alkaline liquid is now decanted from the precipitated wax into a cylindrical vessel, and its color observed. If the wax was pure, the liquor will have a yellow color, while if the resin was present, the liquor will have a more or less intense reddish-brown color, due to the formation of nitrous compounds. This being a colorimetric test, it is well to have some perfectly pure wax for comparison. If the wax contains resin, the reaction is much more violent during the boiling with the acid. As little as one per cent. is said to be detected in this manner.

A FADING STAR.—Mr. Lockyer contributes to *Nature* a very interesting letter upon the new star in Cygnus, which shone out last November, but is now only a star of the ninth magnitude. The spectrum of the star, which at first was full of bright lines, among which lines were prominent those which characterize the chromosphere of the sun, has gradually changed, and the lines have faded out, until now but one remains. This remaining line is not one of those which were conspicuous at first, but was then relatively faint. It has held its own, however, and even brightened a little, till it survives alone. And what is remarkable is that, says the *Independent*, so far as can be judged from such measurements as are possible upon so faint a spectrum, this line is identical with the principal line in the spectrum of the nebulae. (We call attention, however, to the limitation. It is not possible on the strength of any measurements yet made to assert this identity with absolute certainty.) This, taken in connection with the rapidity with which the object hazed up and faded out, leads Mr. Lockyer to suggest that this body may not be a star at all, in the ordinary sense; but a nebulous mass, containing no great quantity of matter and at no great distance. If this hypothesis be true, however, it would seem that the star ought to have shown some sensible motion during the year.

DEAN SWIFT AS A SCIENTIFIC PROPHET.—The *Journal of Chemistry* has received the following note from Dr. Robert Reyburn, of Washington, D. C.: "In the recent accounts of the discovery of the satellites of Mars, we have not seen any reference to the curious fact of the announcement of their existence by Dean Swift in his celebrated satire of 'A Voyage to Laputa,' published in 1726. It may be found in the third chapter of this work, and reads as follows: 'They have likewise discovered two lesser stars or satellites which revolve about Mars, whereof the innermost is distant from the center of the primary planet exactly three of his diameters, and the outermost five; the former revolves in the space of 10 hours, and the latter in 21½, so that the squares of their periodical times are very near in the same proportion with the cubes of their distance from the center of Mars, which evidently shows them to be governed by the same law of gravitation that influences the other heavenly bodies.'" This was expressly written to cast ridicule upon the astronomers of his day, and now about 150 years afterwards it becomes numbered among the established facts of science.



## Table of Highest and Lowest Sales in S. F. Stock Exchange.

Name of Company.	Week Ending Oct. 11.	Week Ending Oct. 18.	Week Ending Oct. 25.	Week Ending Nov. 1.
Alpha.	18 142	15 131	15 121	12 91
Alta.	131 10	111 8	101 70	80 55
Andes.	1.10 95c	1.10 80c	1.10 70c	80c 50c
Baltimore Con.	1.30	6 61	51 61	5 51
Belcher.	261 201	231 211	231 201	181 151
Belmont.	141 11	121 10	121 10	3 210
Best & Belcher.	341 31	331 30	331 29	281 25
Bullion.	141 11	121 10	121 10	3 210
Caledonia.	341 31	331 30	331 29	281 25
California.	2 1.55	1 11	1 11	1 75c
Challenge.	39 34	37 35	34 30	27 24
Chollar-Potosi.	1.30 1.40	1.20 1.10	1.15 80c	90c 65c
Confidence.	61 49	61 48	61 47	51 44
Crown Point.	341 31	331 30	331 29	281 25
Cosmo Con.	15c 10c	15c 10c	15c 10c	5c 5c
Days.	471 46	481 45	471 43	46 44
Eureka Con.	131 11	101 8	12 10	9 4
Exchequer.	25c 25c	25c 25c	25c 25c	25c 25c
Geddes & Bertrand.	1.70 1.20	1.40 1.10	1.35 1.10	1.70 1.10
Gen Thomas.	75c 75c	75c 75c	75c 75c	75c 75c
Grand Prize.	1.70 1.20	1.40 1.10	1.35 1.10	1.70 1.10
Gila.	75c 75c	75c 75c	75c 75c	75c 75c
Globe Con.	75c 75c	75c 75c	75c 75c	75c 75c
Golden Chariot.	75c 75c	75c 75c	75c 75c	75c 75c
Gould & Curry.	75c 75c	75c 75c	75c 75c	75c 75c
Hale & Norcross.	75c 75c	75c 75c	75c 75c	75c 75c
Hussey.	75c 75c	75c 75c	75c 75c	75c 75c
Justice.	75c 75c	75c 75c	75c 75c	75c 75c
Kentuck.	75c 75c	75c 75c	75c 75c	75c 75c
Knickerbocker.	75c 75c	75c 75c	75c 75c	75c 75c
Kosuth.	75c 75c	75c 75c	75c 75c	75c 75c
Lady Bryan.	75c 75c	75c 75c	75c 75c	75c 75c
Lady Wash.	75c 75c	75c 75c	75c 75c	75c 75c
Leopard.	75c 75c	75c 75c	75c 75c	75c 75c
Leviathan.	75c 75c	75c 75c	75c 75c	75c 75c
Madison.	75c 75c	75c 75c	75c 75c	75c 75c
Manhattan.	75c 75c	75c 75c	75c 75c	75c 75c
Mansfield.	75c 75c	75c 75c	75c 75c	75c 75c
Meadow Valley.	75c 75c	75c 75c	75c 75c	75c 75c
Mexican.	75c 75c	75c 75c	75c 75c	75c 75c
North Con Virginia.	75c 75c	75c 75c	75c 75c	75c 75c
New York.	75c 75c	75c 75c	75c 75c	75c 75c
Niagara.	75c 75c	75c 75c	75c 75c	75c 75c
Northern Belle.	75c 75c	75c 75c	75c 75c	75c 75c
New Coso.	75c 75c	75c 75c	75c 75c	75c 75c
Occidental.	75c 75c	75c 75c	75c 75c	75c 75c
Ophir.	75c 75c	75c 75c	75c 75c	75c 75c
Overman.	75c 75c	75c 75c	75c 75c	75c 75c
Pacific.	75c 75c	75c 75c	75c 75c	75c 75c
Panther.	75c 75c	75c 75c	75c 75c	75c 75c
Poorman.	75c 75c	75c 75c	75c 75c	75c 75c
Prospect.	75c 75c	75c 75c	75c 75c	75c 75c
Raymond & Ely.	75c 75c	75c 75c	75c 75c	75c 75c
Rock Island.	75c 75c	75c 75c	75c 75c	75c 75c
Sage.	75c 75c	75c 75c	75c 75c	75c 75c
Seg Nevada.	75c 75c	75c 75c	75c 75c	75c 75c
Sierra Nevada.	75c 75c	75c 75c	75c 75c	75c 75c
Silver Hill.	75c 75c	75c 75c	75c 75c	75c 75c
South Chariot.	75c 75c	75c 75c	75c 75c	75c 75c
Succor.	75c 75c	75c 75c	75c 75c	75c 75c
Trojan.	75c 75c	75c 75c	75c 75c	75c 75c
Union Con.	75c 75c	75c 75c	75c 75c	75c 75c
Utah.	75c 75c	75c 75c	75c 75c	75c 75c
Wells-Fargo.	75c 75c	75c 75c	75c 75c	75c 75c
Woodville.	75c 75c	75c 75c	75c 75c	75c 75c
Yellow Jacket.	75c 75c	75c 75c	75c 75c	75c 75c

## Sales at S. F. Stock Exchange.

Friday A. M., Oct. 26.	145 Chollar.	23c/29
620 Alta.	81c/83	
780 Alpha.	111c/121	
1215 Best & Belcher.	111c/121	
1215 Belcher.	111c/121	
1035 Bullion.	80c 50c	
1405 Baltimore Con.	1.40c	
Confidence.	51c/59	
440 Chollar.	101c/111	
2540 California.	2.20c/2.30c	
1740 Con Virginia.	27c/28c	
845 Crown Point.	5c/6c	
4790 Con Imperial.	85c	
400 Caledonia.	1.50c	
1155 Exchequer.	30c/31c	
870 Gould & Curry.	81c/82c	
1335 Hale & Norcross.	61c/66c	
100 Justice.	101c/102c	
805 Julia.	40c/41c	
240 Kentuck.	61c/66c	
495 Mexican.	91c/101c	
670 Ophir.	141c/142c	
560 Overman.	50c/51c	
590 Silver Hill.	131c/132c	
200 Succor.	21c/22c	
1885 Sage.	80c/81c	
350 Sierra Nevada.	41c/42c	
500 Union Con.	1.30c/1.31c	
320 Utah.	11c/12c	
900 Yellow Jacket.	71c/72c	
AFTERNOON SESSION.		
2145 Argentina.	1.65c/1.66c	
200 Alta.	81c/82c	
240 Andes.	80c	
780 Benton.	90c/91c	
400 Bechtel.	101c/102c	
100 Bodie.	101c/102c	
120 Combination.	40c/41c	
200 Challenge.	101c/102c	
570 Dayton.	55c/56c	
100 Dardanelles.	3c/4c	
340 Days.	15c/16c	
2275 DeFrees.	1.05c/1.06c	
60 Eureka Con.	45c/46c	
150 El Dorado S.	112c/113c	
190 Grand Prize W.	113c/114c	
1175 Grand Prize.	113c/114c	
370 Gila.	1.65c/1.66c	
750 Hussey.	40c/41c	
300 Hornet.	30c/31c	
3315 Independent.	1.17c/1.18c	
200 Joe Seates.	35c/36c	
90 Jackson.	5c/6c	
1510 Kosuth.	25c/26c	
20 K K Con.	3c/4c	
240 Lady Wash.	3c/4c	
540 Leviathan.	45c/46c	
20 Leopard.	1.05c/1.06c	
740 Modoc.	1.05c/1.06c	
100 Meadow Valley.	30c/31c	
100 Manhattan.	111c/112c	
100 North Con Vir.	50c/51c	
300 North Carson.	30c/31c	
625 New York.	30c/31c	
430 Northern Belle.	1.15c/1.16c	
100 New Coso.	90c/91c	
1870 Navajo.	11c/12c	
130 Occidental.	1101c/1102c	
100 Panther.	71c/72c	
400 Peyton.	30c/31c	
700 Prospect.	50c/51c	
350 Rock Island.	15c/16c	
200 Rye Patch.	4c/5c	
200 South Justice.	1.20c/1.21c	
100 Senator.	12c/13c	
100 Silver Prize.	11c/12c	
600 Tiptop.	1.20c/1.21c	
1465 Trojan.	1.10c/1.11c	
250 Ward.	85c/86c	
100 Woodville.	90c/91c	
Saturday A. M., Oct. 27.		
945 Alta.	81c/82c	
305 Andes.	80c	
200 Alpha.	1.10c/1.11c	
200 Alps.	1.10c/1.11c	
1270 Argentina.	1.70c/1.71c	
100 Baltimore Con.	1.70c/1.71c	
1340 Belcher.	111c/112c	
170 Bechtel.	101c/102c	
200 Benton.	1.05c/1.06c	
720 Bullion.	80c/81c	
350 Best & Belcher.	111c/112c	
1455 California.	2.20c/2.30c	
2110 Con Virginia.	27c/28c	

## MINING AND SCIENTIFIC PRESS

100 Belle Isle.	50c
600 Bodie.	80c
130 Belcher.	51c
510 Bullion.	121c/122c
125 Best & Belcher.	111c/112c
950 California.	27c/28c
385 Con Virginia.	27c/28c
460 Crown Point.	51c
250 Coso Con.	1.20c/1.21c
600 Day.	12c/13c
150 Eureka Con.	45c/46c
500 Empire Idaho.	31c/32c
100 El Dorado S.	1.40c/1.41c
50 Endowment.	1.30c/1.31c
1675 Exchequer.	80c/81c
1065 Grand Prize W.	113c/114c
200 Grand Prize W.	113c/114c
200 Golden Chariot.	1.10c/1.11c
815 Gould & Curry.	80c/81c
1550 Hussey.	20c/21c
150 Hale & Norcross.	51c/52c
200 Hornet.	30c/31c
400 Independent.	1.30c/1.31c
115 Jackson.	1.40c/1.41c
835 Justice.	91c/92c
230 K K Con.	3c/4c
200 Leeds.	90c/91c
250 Leopard.	90c/91c
500 Meadow Valley.	25c/26c
330 Mexican.	90c/91c
500 Modoc.	111c/112c
55 Manhattan.	111c/112c
1325 Navajo.	1.55c/1.56c
50 New Coso.	75c/76c
145 Northern Belle.	1.10c/1.11c
350 Ophir.	131c/132c
1345 Ophir.	131c/132c
50 Panther.	90c/91c
135 Raymond & Ely.	131c/132c
150 Sierra Nevada.	111c/112c
650 Silver Prize.	111c/112c
200 Savage.	80c/81c
200 Star.	30c/31c
100 Tiptop.	161c/162c
50 Utah.	30c/31c
435 Yellow Jacket.	91c/92c
Tuesday A. M., Oct. 30.	
100 Andes.	80c
320 Alta.	111c/112c
630 Alpha.	80c/81c
515 Belcher.	41c/42c
1010 Bullion.	61c/62c
405 Best & Belcher.	111c/112c
1445 Con Imperial.	75c/76c
2235 Con Virginia.	25c/26c
1120 California.	27c/28c
620 Crown Point.	51c/52c
120 Gould & Curry.	80c/81c
200 Challenge.	85c/86c
10 Confidence.	101c/102c
100 Dayton.	45c/46c
1630 Exchequer.	80c/81c
220 Gould & Curry.	80c/81c
855 Justice.	91c/92c
835 Julia.	1.55c/1.56c
130 Kentuck.	61c/62c
150 Lady Wash.	3c/4c
255 Mexican.	80c/81c
50 New York.	35c/36c
100 North Con Vir.	101c/102c
120 Old Carson.	1.10c/1.11c
50 Occidental.	1.10c/1.11c
675 Overman.	15c/16c
330 Ophir.	121c/122c
50 Peyton.	101c/102c
500 Rock Island.	15c/16c
250 Silver Hill.	1.47c/1.48c
250 South Justice.	1.24c/1.25c
200 St. Louis.	20c/21c
605 Savage.	80c/81c
160 Seg Nevada.	41c/42c
335 Sierra Nevada.	41c/42c
100 Succor.	2.35c/2.36c
800 Trojan.	1.20c/1.21c
200 Union Con.	1.10c/1.11c
115 Utah.	111c/112c
400 Ward.	80c
400 Wells-Fargo.	80c
515 Yellow Jacket.	81c/82c
525 Alta.	71c/72c
430 Argentina.	1.55c/1.56c
500 Alps.	1.20c/1.21c
605 Best & Belcher.	111c/112c
145 Bullion.	101c/102c
995 Bullion.	41c/42c
100 Bodie.	20c/21c
200 Chollar.	27c/28c
560 Chollar.	56c/57c
990 Con Virginia.	24c/25c
750 Crown Point.	41c/42c
635 Con Imperial.	75c/76c
740 Caledonia.	2.10c/2.11c
405 Gould & Curry.	80c/81c
2705 Exchequer.	41c/42c
500 Empire Idaho.	31c/32c
250 Endowment.	1.30c/1.31c
65 Eureka Con.	45c/46c
550 Gould & Curry.	80c/81c
1035 Grand Prize.	111c/112c
200 Grand Prize W.	113c/114c
150 Gila.	111c/112c
230 Prospect.	35c/36c

## SALES OF LAST WEEK AND THIS COMPARED

Thursday A. M., Oct. 25.		Thursday A. M., Nov. 1.	
1025 Alpha.	81c/82c	301 Alpha.	101c/102c
20 Alpha.	13c	1170 Alpha.	84c/85c
390 American Flat.	1.05c/1.06c	1315 Best & Belcher.	15c/16c
100 Andes.	80c	1420 Bodie.	101c/102c
1025 Bullion.	101c/102c	1530 Bullion.	4c/24 1/2c
125 Best & Belcher.	8c/6c	100 Baltimore Con.	90c
100 Bodie.	21c/21c	800 California.	26c/27c
270 Best & Belcher.	1.20c	750 Con Virginia.	27c/28c
190 Bont.	1.20c	90 Chollar.	27c/28c
110 Con Imperial.	95c/96c	260 Crown Point.	41c/42c
810 Crown Point.	51c/52c	630 Caledonia.	21c/22c
100 Empire Idaho.	31c/32c	205 DeFries.	1.00c
800 Con Virginia.	30c/31c	170 Challenge.	75c
101 California.	30c	460 Exchequer.	50c/51c
430 Caledonia.	34c/35c	940 Gould & Curry.	71c/72c
1000 Chollar.	1.10c	745 Hale & Nor.	57c/58c
445 Exchequer.	101c/102c	1160 Juneau.	9c/9c
865 Gould & Curry.	104c/105c	635 Julia.	1.90c/2c
330 Hale & Nor.	71c/72c	100 Kentuck.	51c
660 Justice.	12c/12c	600 Mexican.	50c
1000 Justice.	71c/72c	600 New York.	50c
1100 Kentuck.	7c	725 Ophir.	134c/141c
1000 Leviath.	25c/26c	255 Overman.	16c/17c
300 Losanth.	55c/56c	100 Rock Island.	25c
1000 Losanth.	1.30c	1155 Savage.	41c/42c
330 Mexican.	101c/101c	600 Sierra Nevada.	4c/4c
110 Monumental.	10c	570 Solid Silver.	41c/42c
1000 New York.	30c/30c	55 Succor.	21c
250 North Con Vir.	56c/56c	150 Union Con.	54c
700 Overman.	134c/134c	600 Wells-Fargo.	50c
565 Ophir.	16c/16c	90 Yellow Jacket.	81c
450 Payson.	1.30c/1.30c		
200 Prospect.	35c/35c		
400 Rock Island.	25c/25c		
155 Sierra Nevada.	4.55c/4.60c		
10 Solid Silver.	101c/101c		
555 Savage.	101c/101c		
800 Silver Hill.	1.80c/2c		
100 Succor.	2.30c		
200 South Justice.	1.40c/1.40c		
125 Trojan.	1.40c/1.40c		
90 Uta.	13c/14c		
510 Union Con.	54c		
100 Ward.	84c		
50 Woodville.	35c		
560 Yellow Jacket.	81c		
AFTERNOON SESSION.		AFTERNOON SESSION.	
580 Alpha.	81c/82c	915 Alpha.	81c/82c
100 Alpha.	12c/12c	50 Andes.	80c
105 Alpha.	1.70c/1.71c	100 Alps.	2.15c
50 Argentina.	11c/11c	600 Argenta.	1.70c/1.71c
100 Bodie.	101c/102c	100 Bodie.	45c
430 Best & Belcher.	11c/11c	350 Bodie.	27c/28c
400 Bodie.	11c/12c	1475 Bodie.	4c/4c
400 Bodie.	11c/12c	575 Best & Belcher.	18c/18c
400 Bodie.	11c/12c	4800 Bodie.	4c/4c
400 Bodie.	11c/12c	500 California.	27c/28c
400 Bodie.	11c/12c	900 Con Virginia.	27c/28c
400 Bodie.	11c/12c	805 Crown Point.	41c/42c
250 Bodie.	51c/51c	600 DeFries.	1.00c
400 Bodie.	11c/12c	600 DeFries.	1.00c
640 Con Imperial.	85c/86c	2565 DeFries.	1.20c/1.20c
405 Con Virginia.	29c/29c	120 Day.	34c/34c
400 Crown Point.	41c/41c	50 Eureka Con.	45c
800 Crown Point.	41c/41c	100 Empire Idaho.	31c/32c







## Tuscarora District.

We condense the following from two letters from Tuscarora, by a correspondent of the *Eureka Sentinel*:

## Tuscarora.

Is situated in the foothills of the mountains on the north side of Independence valley, a few miles from its head, and is about two and a half miles northeasterly from the old town of Tuscarora, on McCann creek, which had its inception in the placer gold mining excitement of 1866, and known at that time as the "Goose creek" excitement, owing to a mistaken idea regarding the geography of the country, the stream of that name being in a range of mountains 100 miles north of here. The town commands a fine view of the valley, and is discernible as you approach it on the Elko road from the foot of the opposite mountains. It presents the appearance noticeable in all new mining towns in districts about which an excitement like this is raging. The location is favorable. But little grading is required, and the clay, which is abundant in the suburbs, makes the best quality of bricks.

## The Mines.

The principal mines of the district, yet discovered, are located within an area of a quarter of a mile from the business portion of the town, the hoisting works of one of them, the Young America, being located at the junction of the two principal business streets. Those upon which steam hoisting works have been erected are the Grand Prize, De Frees, Silver Prize, Young America, Navajo and Hornet. Preparations are also being made for working by steam power the Golden Prize and South Navajo. The Argenta, which is owned principally by the stockholders of the Grand Prize, is worked through that company's shaft. It is supposed to be a continuation of the Grand Prize lode. In addition to the above may be named as ranking among the claims of established merit, the Grand Central, Independence, Diana, Moscow, Venture, Golden Eagle, Lida, North Central and others that I have visited, but the names of which at present escape my recollection. There are also a large number of locations in which nothing has yet been developed, but which the owners are vigorously prospecting, encouraged by the discoveries already made in their vicinity.

## The Mills.

The Grand Prize company is running two mills, one of 20 and the other of 10 stamps. They are both running exclusively upon ores from the company's mine. The new hoisting works, in the place of those which were destroyed by fire a few weeks ago, are completed, as are also the Howell rotary furnaces at the mills. Everything is working finely, and it is confidently predicted that the bullion shipments for the next month will average \$10,000 per day. The De Frees company have a four-stamp water power mill across the valley, which is doing good work, crushing the ore from the mine. The Independence mill, of 10 stamps, will be completed in two or three weeks, and will immediately commence working ore from the Independence and Navajo mines.

## Accommodations.

The greatest inconvenience experienced by a stranger upon his arrival here is the difficulty of procuring a bed. There is an excellent two-story hotel here, and more than a dozen lodging houses, but they are always full, and upon the arrival of a stage there is the tallest kind of rustling among the passengers to find a place to rest their cramped and weary limbs, and lucky indeed is he who cannot, like the Son of Man, draw an unfavorable comparison between his condition and that of the foxes of the earth and the birds of the air.

## How to get There.

There are two stage lines connecting with the Central Pacific railroad—one at Elko and the other at Battle Mountain. The fare on each is \$7.50. The stage leaves Elko about 7 o'clock in the morning, arriving here at from 3 to 5 o'clock in the afternoon. Returning, it leaves here at 7 o'clock A. M., and arrives in Elko about the middle of the afternoon. Mr. Smith Van Dreillen, whilom of the Eureka and Elko line, is the proprietor. From Battle Mountain the stage leaves at 2 o'clock P. M., and arrives here from 1 to 4 o'clock the next morning. It leaves here at midnight and reaches Battle Mountain in time for the Eastern and Western bound trains. Persons from Eureka, coming here via Battle Mountain, get through from 12 to 14 hours earlier than by the Elko route. The greater portion of the travel is, however, by night, while the Elko stages come through by daylight. Both lines are well stocked, and each one possesses advantages relatively over the other in the matter of time and comfort. In the language of the showman: "You pay your money and you take your choice."

## Altitude and Climate.

The town is situated upon an elevation of something over 7,000 feet above the level of the sea. Although but a thousand feet nearer heaven than Eureka, the difference in the density of the atmosphere is clearly perceptible. That the snow falls to a great depth in this vicinity, is evident from the natural indications as well as from the evidence of those who have sojourned here during the winter months.

## The Grand Prize.

This is the only dividend-paying mine at present in the district, although there are sev-

eral in which developments have been made, which justify the prediction that they will rank in that category in the early future. The richness, permanency and extent of the Grand Prize are no longer matters of conjecture. It is a true fissure vein, with well defined walls enclosing a ledge of from three to eight feet in width, the ore increasing in richness as depth is attained. The main shaft is down 280 feet, on a six-foot ledge of \$300 sulphure ore. The two mills of the company are kept running continuously, and it is confidently predicted that the bullion shipments for the next month will average \$10,000 per day. The mine is located on a ridge, about a quarter of a mile northeast from the business portion of the town.

## Other Prominent Mines.

The De Frees is located on the same ridge, and about 300 yards westerly from the Grand Prize. They have a good body of ore at the depth of 280 feet. The company are building a new mill of 10 stamps on the other side of the valley, and expect to extract sufficient ore to keep it running when finished. The Silver Prize is about 1,000 feet southerly from the De Frees, and is regarded by many as next to the Grand Prize, the most promising mine in the district. The incline shaft is down 160 feet, with a four-foot ledge at the bottom. They are taking out a considerable quantity of high-grade ore. They are getting down to the sulphure ore, which is of the same character as that found in the Grand Prize. The Navajo is situated on a ridge nearly half a mile westerly from the locations above named, and on the other side of the town. Their ledge incline is only down about 70 feet, from which they are drifting north and south in good ore. They have a main shaft sunk 175 feet, and at the depth of 150 feet are drifting for the ledge. Great interest is manifested in the result of their explorations, as the result will be deemed in a great measure indicative of the character and value of the locations on that mineral belt. There are probably a dozen other mines which are equally worthy of mention as those which I have briefly described, but which time and space will not permit me to specially notice.

## Conflicting Locations.

There is no chance for a newcomer to locate any mining ground upon what may be termed the Tuscarora mineral belt proper, or that section embraced within from a quarter to a half a mile from the center of the town, as it is all covered, in some instances, three or four deep with previous locations. If the ground is as valuable as it is confidently believed to be, this is bound to become a perfect paradise for lawyers. There are plenty of chances, however, for prospectors a little further off, and quite a number of promising locations have recently been made within a few miles of the town. Rock creek, about 12 miles west from here, where the Falcon claim is located, is receiving considerable attention and is believed to abound in valuable ledges.

## The People Here.

The population of the place is decidedly cosmopolitan in character. Idaho, Montana, Utah and California are well represented, and there is a fair sprinkling of tender feet from the sunrise side of the Rockies. People of nearly every nation, Missouri included, are here, and the streets present as great a variety of representative humanity as can be seen on the thoroughfares of San Francisco itself.

Fuel is scarce and proportionately high. Cottonwood and quaking aspen retail readily from \$10 to \$12, and nut pine at from \$14 to \$16 per cord. The principal fuel used at the mills and hoisting works is sage brush, for which is paid about \$3 per cord. Coal from the Rocky mountains has been brought here, but does not appear to be much used for domestic purposes.

## Conclusion.

In conclusion, I will remark that I believe Tuscarora is destined to become one of the principal mining towns in the State, and that, too, in the early future. My reasons for so believing, I have before given in this letter, but I would advise no one, and especially those seeking employment, to come here until the spring opens. There are more men here now than can find employment either in the mines or mills, or at manual labor. The winter is close upon us, and all of the signs indicate a severe season. At this altitude the snow falls to a great depth, and it is not improbable that transportation of freight will be suspended for perhaps weeks before the spring opens. It is not unreasonable to predict hard times under the circumstances. In view of these things many unemployed persons here are preparing to leave, with the intention of returning after the breaking up of winter. Let those who intend to come here to take chances, defer their visit until spring.

By the Hendy automatic concentrator, lately set to work by Purvine & Bernard, a saving of about \$20 per day over the process previously in use is effected. In addition to this there is a further saving of the wages of two men, as two men less are required now than were needed with the imperfect and expensive hand process. The Hendy concentrator is a very ingenious piece of mechanism, and to see it work is well worth the walk from town to the works in Silver Bow creek, a little over a mile distant.—*Butte (Montana) Miner*.

C. S. OSBORN is arranging to resume operations on the Pacific Sulphur Works, and has gone to work with a force of men on the mine.

## Mines about Hornitos.

The *Mariposa Gazette* says: We learn that the valuable mines in the vicinity of Hornitos, which have lain covered up and dormant for an indefinite time in the past, are really coming to the surface—developing that untiring energy and persistent will, particularly characteristic to many of the old-time miners, who, in earlier days, experienced and witnessed the valuable ores taken from the rich quartz veins in this section. They have, as we said, been persistently holding on, waiting for the gold to come forth without the application of their own physical labor, till at last, in the evening of time, these owners and holders of mines have become gray and blanched "waiting for the wagon," and have resolved to strike once more for the "root of all evil," which they have done, and are being richly rewarded for their industry and labor. Hornitos and vicinity will yet, and we predict soon, be the golden lap of Mariposa county, for it abounds with innumerable and inexhaustible rich quartz lodes sufficient to enrich a multitude of people. The late discoveries and successful developments made in the rich quartz lodes to which we have alluded is but the commencement of a new era of mining, thereby creating an impetus by which further and greater developments will soon follow, making for itself one of the best mining districts in California.

Notwithstanding the dry season has been quite unfavorable to farmers and stockmen, the mining prospects are brilliantly looming up, and appear more propitious than has been the case for many years. The McMillan mine is situated near Indian Gulch, and bids fair to become famous for its rich deposits of gold, which are daily being developed and brought to the surface. During the last two months \$6,000 have been taken out of this mine and forwarded to the mint for coinage, and, from present appearances, gold will flow freely from this mine for some time to come. This is an old mine, having been discovered by Mexicans some 20 years ago, who, by the use of mortars and arastras, took an immense amount of gold therefrom, which is well remembered and known to many of the oldest inhabitants residing in that vicinity. A tunnel of considerable length was run, giving a backing to the mine of some 30 or 40 feet, and shows a true fissure vein, averaging from five to six feet wide. Mr. A. J. McMillan is the lucky owner of this valuable mine.

## The Royal Mine.

Surnamed John S., is located a short distance north of Tuleto, an old mining camp but a short distance from the town of Indian Gulch. This mine has about 300 tons of good milling ore already out upon the dump. It is a well-defined vein, and so far the rock appears excellent. The mine has been bonded for \$25,000 for a certain length of time, with the privilege of buying. Mr. Royal is remarkable for his energy and sagacity, and is wholly devoted to the science and skill of mining for gold and silver.

## The Duncan Mine

Is located near Judge McElroy's residence on the west side of the Mariposa road, about one and a half miles from Hornitos. It is known as the old Duncan mine, worked many years since by men inexperienced in the skill of extracting gold from quartz rock, but at the same time a great amount of gold was found in pockets upon the outcroppings of the vein. Mr. Jerome B. Brown became owner of the mine some three or four years ago, and has since secured a U. S. patent thereto. He has recently, and in a brief time, taken out about \$3,000, and is energetically pushing ahead after more of the same sort. A few more pockets of like amount, and Mr. Brown will cause a first-class steam power quartz mill to be constructed and erected thereupon, one that will cause the denizens to weep with tearful joy.

## The Washington Mine

Is thundering away with its 20-stamp steam power mill—its chlorination works, its thousands of tons of ore already upon the dump, its hundreds of cords of wood piled up in regular order, and its store, hoarding-house, saloon, and, in fact, the whole town of Washington mine, which comprises two or three dozen houses, go to prove that this is a paying and thriving institution, so much so, that 10 more stamps are being added to the mill.

CARBONATE POINT.—A correspondent of the *Belmont Courier* gives a very encouraging account from the above camp. He says: The mines here are opening out splendidly. A Coffman has taken a lease on one of the mines, and with the help of one man, is taking out over three tons of ore daily, worth over \$250 per ton. There are eight men working in the mines and more men will be set to work as soon as there is room for them and sufficient teams can be got to haul the ore to Wadsworth. There are several men building houses and prospecting on their own account. The weather is so warm and pleasant that one pair of blankets are sufficient to sleep out with and be comfortable. Snow never lays here for any length of time. The Illinois mine ships about 100 tons of ore a month. There are about 40 men working in the mine and the prospects are favorable. Mining sharps (of the bonding kind) have been around here lately. They are very reticent, look wise and want to take hold. They are not apt to get hold of any paying mines, as the owners prefer selling their ore at Sacramento to selling their mines on jawbone collateral.

## Arizona Mines.

The *Arizona Enterprise* of the 13th ult. says: From Mr. Allen Cullumber we learn that Hoffler's mill in Walnut Grove started up on the 5th on a batch of 40 tons of ore from the Arhuckle mine. The next run will be on ore from the Golden Crown. The ore from this mine averages as high as \$100 per ton in gold in an arastra. The shaft is down 40 feet, and they have now commenced drifting. The outlook in this district is the brightest it has been in the last 14 years. Since the mill has started up it has infused new life into the entire district.

The Turkey creek miners are a hopeful, cheerful set of men, and now that they are at last to have a good mill in their camp, feel that fortune is about to favor them with some of her smiles, after so many frowns. We have no doubt as to the richness of the ores in that district and feel confident that the mill will not only be well supplied with custom work, but that the owners will give entire satisfaction to their customers. Mr. Masterson expects to have the mill in full operation in a very short time, when we will give our readers a detailed description of it and its workings.

Several sales have taken place within the last week or so, among which we note that of Jack Swilling's sale of the Golden Glance claim, in Black canyon district, to Peter McArdell, for the sum of \$1,750; J. P. Avery to G. Urfer & C. Osterwald 1,000 feet of the "76" lode in Humbug district, for \$300; W. R. Gillespie's sale of the McPhee, Isabella and Omega claims, in Black Canyon district, to George Opydke, for \$200; H. E. Mann has also sold to Alexander Gilmore the Palmetto and Golden Treasure claims, situated in Tiger district, for \$200.

The Sheriff's deed, conveying the ground, furnace, building, etc., belonging to the Final gold and silver mining company at Walnut Grove, was recorded on the 10th inst. The property was sold to Mr. C. B. Genung on the 1st inst., for the sum of \$1,510.

The Bank of Arizona, Treasurer of the Peck mining company, shipped by this morning's stage two bars of bullion, one of 1,474.40 oz., 919 fine, valued at \$1,751.88, and one of 1,459.70 oz., 925 fine, valued at \$1,745.80. Total weight, 2,934.10 oz., valued at \$3,497.68.

The tunnel of the Peck mine is now in over 600 feet, and the ore body shows larger and richer than ever. Mr. Bean, President of the company, yesterday showed us some large specimens of ore taken from the last car-load from the mine in the day he was there—Wednesday last. The ore we saw will go at least \$10,000 per ton, and Mr. Bean says there is plenty of it.

The Peck mine will yield at least \$100,000 per week when the work of development is so far advanced as to permit the rapid and easy extraction of the ore, and when the proper reduction works are erected. About \$18,000 gallons of water flow from the Peck tunnel every 24 hours, making a stream sufficient to supply all the machinery used at the mine, as well as what is needed for other purposes.

The black Warrior mining company have contracted with Mr. Masterson to work 40 tons of ore from their mine when the mill on Turkey creek is completed.

The revenue from the tax on the net proceeds of mines in Mohave county bids fair this present quarter to excel that of any previous quarter since the law was first enforced.

## Camp Tellurium.

Notwithstanding there is a large amount of ore pressing down the creek daily, some to the mile in this camp and some to the works in Boulder, Golden and Denver—an amount largely in excess of shipments during the past four years—there is still a marked stagnation in mining and a decrease in the amount of work for development, which plainly shows a want of capital. It is in vain that a few dollars are expended by the miner in getting down to "pay," when his "grub stake" is but the pittance saved from a few months of hard toil. His show of ore may increase in value with every foot of depth gained, and he often thinks that what he takes out ought to bring sufficient returns from the mills to pay at least something towards the expense of mining. But he is always disappointed. There is one and then another who may get a few dollars occasionally, but neither the number of miners nor dollars amount to enough for continued effort or hopeful remark. If this condition of things remains for the year to come, more than one-half the miners will be obliged to leave the mountains and find other employment, and years will be required to put a large number of mines in paying condition which ought to be paying now.

The mills in this camp continue to run regularly, and the Atchison company's mill, at the junction of Four-Mile creek and Gold Run, is likely to be in working order in the course of a few weeks. Willard's process for roasting is to be used in this mill, the experiment made at Jarestown having proved satisfactory to the Manager of the company's mill Mr. Philip.

There are not more than a dozen lodes being worked in this vicinity at this time, so far as I am able to learn, among which are the Eclipse, Vire, Paymaster, Dime and Crocus. These are not furnishing much ore for market, though all are considered to be good lodes and show what appears to be good ore. When the Atchison company's mill is ready to work, it is probable the Lincoln and the Indiana lodes will furnish ore for reduction, but they lay idle at present.—*Boulder (Col.) News*.



## Eureka Consolidated Mine.

The following is a synopsis of the President's, Superintendent's and Secretary's report for the fiscal year ending October 15th, 1877:

From the retiring President's report we take the following: The fiscal year just closed has been a most important one to the company, and its termination leaves its affairs in a most prosperous state. At the last annual meeting the company was largely in debt, and no pay bodies of ore were known in the mine. Since then valuable bodies of ore have been discovered and developed, for the extent of which I would respectfully refer you to the report of the Superintendent, and dividends paid therefrom.

From the Superintendent's report we have taken the following:

During the past year 24,968 tons of ore were extracted, 4,189 feet of drifts run, 1,685 feet of winzes sunk. The 5th, 7th, 8th and 9th levels were extended to the west line. Winzes have been sunk 200 feet below the 9th level, making a total depth of 950 feet from the surface. Large bodies of ore have been found near the west line, extending from the 5th level to the bottom of the winze below the 10th level, a distance of 900 feet on the dip of the vein, exposing an amount of ore sufficient to keep the furnaces running to their full capacity for at least a year. A large and valuable body of ore has also been developed by the Richmond on our 10th level (while the lawsuit was pending), which adds materially to the value of the property. Nearly all the ore found in the mine up to the present time has been on or near the foot wall, and no prospecting has been done toward the hanging wall, except on the 9th and 10th levels, in which I think we may reasonably expect to find valuable deposits of ore. The machinery at the mine is all in first-class order, also the furnaces.

## Secretary's Report.

## RECEIPTS.

From 1,211 tons bullion (refined).....	\$ 430,742.23
Sale railroad cars, locomotives, etc.....	75,000.00
Sale flue dust.....	7,199.35
Sale wood.....	617.75
Sale scales.....	415.60
Sales old iron, etc.....	1,181.35
Advance on bullion shipments.....	635,000.00
Balance in hands Superintendent.....	236.66
Cash in office.....	135.17
Supl.'s drafts outstanding.....	11,908.37
Bills for supplies (not due).....	5,553.40
<b>Total.....</b>	<b>\$1,177,039.78</b>

## DISBURSEMENTS.

Mine Account—	
Labor at mine.....	\$145,462.48
Timber and lumber.....	23,050.23
Hauling ores.....	12,010.07
Wood and coal.....	12,558.31
Purchase of ores.....	19,585.97
Sundries.....	22,370.06
<b>Smelting Account—</b>	<b>\$235,056.02</b>
For labor.....	\$ 57,145.06
Charcoal.....	200,415.55
Sundries.....	27,177.80
General expenses.....	24,724.54
Expenses San Francisco.....	9,125.13
Bills payable.....	50,000.00
Freight, refining, etc.....	172,583.51
Legal expenses.....	91,557.41
Dividend.....	150,000.00
J. & W. Seligman advances on bullion.....	75,000.00
Anglo-California bank.....	41,781.00
Book account.....	1,908.64
Superintendent's drafts.....	3,603.62
In hand of Superintendent.....	310.00
Balance cash on hand.....	25,052.15
<b>Total.....</b>	<b>\$1,177,039.78</b>

## Prospect Mountain.

The Eureka Sentinel says: In any other locality the existence of a mountain of ore, as Prospect mountain can safely be called, on whose rugged sides a pick can scarcely be struck into without striking a paying body of ore, would create an immense furor, and its possession would be heralded to the world as an endorsement of the claims of that locality for the investment of outside capital. The great drawback to its development has been the fact that almost all of the mines are owned and worked by individuals and small companies, who have been content to hold on to their locations, extracting sufficient ore in the meantime to pay expenses, and waiting patiently for the time to come when their merits would be conceded. The only instance in which outside capital has been invested on the mountain, shows what reward awaits those who have the courage to purchase. We allude to the Metamoras, a company of Chicago capitalists; and the energetic work they have expended on the mine, has been rewarded by splendid returns. The company have not only got back their original expenditures, but also have developed a large and rich body of ore, that will, while in process of extraction, place the mine in the foremost rank of bullion producing properties. The same will be the history of a hundred other mines in the same locality, whenever capital joins hands with labor to help prove their value.

One of the most important enterprises ever inaugurated in the district, and one pregnant with future results, is the Prospect mountain tunnel, a work that is being steadily carried forward by the proprietors, who have the most unlimited faith in its future importance, both as a means of proving the existence of large ore bodies in the depths of the mountain, and as an economical factor in the working of the mines already located. Very little has been written or said in regard to the enterprise, the stockholders preferring to push the work steadily without any particular heralding of its importance, content to await its completion for their reward. The tunnel is now in 370 feet, and progressing at the rate of ten feet per week.

## USEFUL INFORMATION.

## Notes on Tanning.

A writer in the *Polytechnic Review*, in the course of an article on the art of tanning skins, gives the following brief summary of the operation, which may be of value to some of our readers. He says:

Hides fresh from the slaughter house are washed, to remove blood and dirt, (if the hides be salted they must be soaked in water for 10 to 14 days,) and for this purpose a running stream is the best. The next treatment is the removal of the hair and fleshy substance, which is often preceded by a preliminary soaking of the hides in pits containing lime water (the refuse lime of the gas works, which contains sulphide of calcium, often gives good results).

The knife made use of is called the dressing knife, and the operation of dressing requires great skill on the part of the workman. To ascertain when the skins are to be removed from the lime pits, they are touched with the fingers to see if the hair still adheres. If the lime has acted sufficiently, they may be taken out and placed on the beam (so called) and the hair scraped off by means of the hairing knife. When all this has been accomplished, the ears, tail, and legs are removed and the skins washed in water containing the dung of fowls or dogs to remove all foreign substances still remaining. In this country the hides are frequently exposed for several days to foul air and sprinkled with water; after this the hair comes off with ease—this operation is termed cold sweating, and affords a larger yield of leather than any other method.

For sheep skins, treatment with bran water is very advantageous since it makes them more susceptible to the action of tanning solutions. Barley meal, spent tan, liquor and diluted sulphuric acid are likewise used. The disadvantage of the latter is that it injures the leather.

Great care should be taken not to bring the skins too rapidly in contact with the tannin, they are first immersed in a weak solution and then in a stronger. The quantity of bark employed is from four to eight times the weight of dry hides. The progress of the tanning operation is ascertained by examining from time to time a freshly cut edge of the hide, which shows the depth to which the tannic acid has penetrated. The hides are placed in a horizontal position in the pits, at the bottom of which a layer of old tan has been placed. On this are placed alternating layers of hide and fresh oak bark until the pits are nearly full. On the top layer some two feet of spent tan is placed and the pit filled with water. After being left in this position for some three months, they are taken out and replaced in other tanks. After the tanning and drying is complete, the resulting product is termed leather.

## Unlawful Forms for Business Cards.

Many complaints have reached the Treasury Department that merchants and business men, in various parts of the country, have been in the habit of printing business cards bearing such close appearance to the United States and National Bank issues that many people have been deceived thereby, and quantities of it have been passed as good money by persons who have gathered a number of these cards. Some of the samples received at the Secret Service Division at Washington are of a character to deceive even observant persons; certain samples just received, representing fractional currency and five and ten dollar notes while they bear upon their face the fact that they are not really genuine, are so very close in their imitation as to have deceived many people, and there is evidence here of one of these cards, issued by a firm in Philadelphia, without any evil intent whatever, having been passed upon a number of people. These issues are all in violation of the law, of which the persons employing such means of advertising their business seems to be ignorant. Section 5,430 of the Revised Statutes, in reference thereto, forbids the engraving or printing of anything in the impression or the likeness of any United States obligation or other security, or any part thereof, except under the authority of the Secretary of the Treasury. The penalty is a heavy fine and imprisonment. The practice, however, continues, and all because of ignorance of the law. Many indictments have been found against persons on this account, and the Department now intends to prosecute to the full extent further continuations of the business as a matter of protection to the community, the poor and more ignorant members of which are very thoroughly imposed upon.

## How to Preserve Mirrors.

It is a fact worth knowing, but which does not seem generally understood, says the *Crockery and Glass Journal*, that the amalgam of tin-foil with mercury, which is spread on glass plates to make looking-glasses, is very readily crystallized by actinic solar rays. A mirror hung up where the sun can shine on it is usually spoiled; it takes a granulated appearance familiar to housekeepers, though they may not be acquainted with its cause. In such a state the article is nearly worthless; the continuity of its surface is destroyed and it will not reflect outlines with any approach to precision. Care

should therefore be exercised in hanging. If any of our readers have mirrors which appear to be spoiling, it would be well to ascertain whether the direct sunlight strikes them. If thus exposed, they can probably be saved from further injury by simply changing their position. The back as well as the front must be protected. A small glass hung in a window, where the rays strike it behind, is peculiarly exposed. The back should always be covered where the beams are likely to touch it.

The greatest danger to looking-glasses, however, is in transporting them. Very expensive ones have been seriously injured by careless handling when merely carried across a street. The men who move furniture are seldom fully aware of these possibilities, and need to be cautioned and watched. Frequently a man or boy may be seen in the street carrying a mirror in such a way that the full glare of noon-day strikes and injures it. Owners of such articles would, as a rule, be able to keep and use them much longer if they would exercise much caution in this regard. To resilver a pier-glass often costs as much as one-fifth of the original price of the article, while the common glass is seldom worth resilvering.

It is also well to avoid hanging a mirror near a stove or fireplace, where the heat radiated can reach it. If this precaution is neglected, granulation is likely to occur, even in a comparatively dark room, by the influence of warmth instead of light. A lamp or gas jet, if placed too close while burning, though it may not crack the glass, will often bring about the same injurious crystallization, and will even sometimes cause the amalgam to melt and run off.

## CLEANSING FEATHERS OF THEIR ANIMAL OIL.

The following recipe gained a premium from the Society of Arts: Take for every gallon of clean water one pound of quicklime, mix them well together, and when the undissolved lime is precipitated in fine powder, pour off the clean lime water for use. Put the feathers to be cleaned into another tub, and add to them a quantity of clean lime water, sufficient to cover them about three inches, when well immersed and stirred about therein. The feathers, when thoroughly moistened, will sink down, and should remain in the lime water three or four days, after which the foul liquor should be separated from them by laying them in a sieve. The feathers should be afterwards well washed in clean water and dried upon nets, the meshes of which may be about the fineness of cabbage-nets. The feathers must, from time to time, be shaken on the nets, and as they get dry will fall through the meshes, and are to be collected for use. The admission of air will be serviceable in drying. The process will be completed in three weeks; and after being thus prepared, the feathers will only require to be beaten to get rid of the dust.

TEST FOR MACHINE OILS.—A German paper announces that a simple test for the presence of free acid in machine oils consists in pouring the oil to be tested over a layer of cuprous oxide contained in a glass. (The ash of the copper-smith answers the purpose, since it contains this oxide). If the oil contains either free, fatty, or resinous acid, the same will attack the oxide and color the oil green in a very short time. Slightly heating accelerates the action, which manifests itself in less than half an hour. This test is said to be very delicate and more satisfactory than any hasty test heretofore devised.

## GOOD HEALTH.

## A Tale of Consumption.

[Written for the Press by Dr. Dio Lewis.]

Thirty years ago, and while I was practicing my profession in Buffalo, N. Y., Henry S—, a slight, pale, young man, presented himself one morning, and asked me to examine his lungs. The examination over, he scanned my face with eager solicitude, and in a trembling voice, said: "Nothing there but a little bronchitis or something of that sort, is there?"

I did not reply at once, and during the silence it was painful to watch his face. I asked:

"Are your parents living?"

"No, they are both dead. My mother died when I was six weeks old, and they say she died of exhaustion. My father died of bronchitis. The doctors pronounced it a complication of dyspepsia and bronchitis, but they all agreed there was no consumption about it. And I might as well tell you that I had a sister, and she is dead. Her malady the physician called *marasmus*. So you see there is no consumption in the blood. I don't know as there was any use in my troubling you with my little ailments. I should soon be all right again of course, but I have a friend who is sort of fidgety about me, and I promised her that I would drop in sometime, when I happened to be passing your office."

Poor fellow! my heart ached for him. I suppose that during my 35 years of medical experience, I have met a thousand victims of consumption, who, like this young man, tried to shut their eyes so that they should not see. I resolved to be honest with him, and as tenderly as possible I said:

"I am sorry you are trying to deceive yourself. You must learn the truth soon; why not see it now while there is time to do something. You are probably mistaken about the malady of your parents, and sister, but nothing can be more certain than that you have genuine consumption. You seem to be a person of spirit and courage. If I am right it is, perhaps, not too late to turn aside the shaft. At any rate the only chance of escape lies in clearly comprehending the danger, and, with your eyes wide open, boldly meeting it."

I may here inform the reader that he gave me the name of the physician who had attended his parents, and I wrote for information. The family doctor assured me that both parents died of tubercular consumption, and the sister, he presumed, died of the same malady.

I advised my patient to take a vacation, and come to see me daily. On the following morning he brought with him a pretty, modest girl, who told me, with many blushes, that she had a right to be interested in everything that concerned Harry. He had not told her my opinion of his case, but had brought her to hear from me the dreadful news. It has been very rare in my experience to witness anything so touching as her grief when I told her that her friend had the consumption.

"Is there no hope?" she cried. When I said, "there is still hope, if certain things can be done," she replied, with startling energy: "It can be done! It shall be done! No matter what it is! Nothing shall stand in the way!"

It does not matter what our discussions were; it does not matter that many difficulties sprung up; it only remains to inform the reader that within a few days two saddle horses were purchased, the young woman's hair cut short, two suits of corduroys obtained, and what seemed two young men, with saddle bags stuffed with good flannels, left Buffalo for Virginia and the South. I need not tell you how a pulse of 95 came down to 75 in 10 weeks, nor how while riding through northern Georgia and Alabama these two travelers often came from 20 to 30 miles a day; nor how when they came up the Mississippi valley the next spring, they were obliged to add two ponies to their riding stock, as their daily distances had become too great for their animals; nor how when they arrived in Buffalo, after an absence of 8 months and 21 days, having ridden on horseback about 4,300 miles, they were the brownest and roughest and toughest young chaps you ever saw; nor how one of the young men, with the assistance of old friends, was transformed into a bride with a stunning veil; nor how the two devoted travelers insisted upon sitting for the ceremony on the same horses that bore them away to health and happiness nine months before; nor how the horses were bedecked with flowers and petted as if they were parties to the new relation.

I could tell you about these things, and many more which would enhance the interest of the story, but this is not my purpose.

What I will state is, that Henry S— and his faithful wife kept up, under my exhortations, a daily ride of 10 to 15 miles, and at length came to believe, as firmly as I did and as I do, that the case of consumption must be desperate that can resist a year of life in the saddle.

RUSSIAN REMEDY FOR HYDROPHOBIA.—A correspondent in *Land and Water* gives the following Russian remedy for hydrophobia: In Saratov the inhabitants collect the larva of the rose beetle (*Cetonia aurata*) which are chiefly found in the wood-ants' nests. The grubs are gathered in the spring, placed in earth and their change of metamorphosis watched for. When this takes place, they kill the beetles and dry them. The powdered insect must be kept in hermetically sealed bottles, or the dried beetles may be kept in sealed pots and reduced to powder when wanted. Three beetles, powdered, is considered a dose for an adult given immediately after the bite. One for a child and five for an adult in which the disease has declared itself. The effect is to produce a long sleep, which must not be interrupted. The bite is also treated surgically. The beetles caught on flowers are not so beneficial; they must be secured in the larva stage and killed directly after they attain the imago. Some of the Russians give their dogs occasionally half a beetle as a preventive.

POISON IN WALL PAPER.—The investigation of this subject continues among the analysts. The *English Mechanic* says that 50 samples of wall paper recently examined were found to contain arsenic either as arsenic or aceto-arsenite of copper. Some papers with green figures were found to be free from arsenic, while, as a rule, the higher-priced qualities contained the poison in the largest quantities. A room of the moderate dimensions of 15 feet square and 9 feet high would be covered, if these papers were used, with "ornamental" surfaces containing from 52 grains to more than eight ounces of poisonous matter.

DEATH FROM CHLOROFORM AVERTED.—A correspondent of the *British Medical Journal*, communicates the interesting observation, that in a case of syncope during the administration of chloroform, where the usual treatment was without effect, and death seemed imminent, the application of some lint saturated with nitrite of amyl to the nostrils was followed almost immediately by restoration of the pulse, and the subsequent recovery of the patient.



# MINING SCIENTIFIC PRESS

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Our latest forms go to press on Thursday evening.

SAN FRANCISCO:

Saturday Morning, Nov. 3, 1877.

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**SILVER LAKE DISTRICT.**—Those who are fully  
competent to judge declare the ores of the Sil-  
ver Lake district to be less difficult to work  
than any other silver ores of Montana. The  
country rock is dolomite lime, and the gangue  
carbonate of baryta. The ore found in this  
matrix is so easily amalgamated that it is worked  
to 95 per cent. of its assay value by milling  
process, anything but elaborate. We are per-  
mitted to make the following extract from a  
letter lately received by Wm. Purvine from one  
of the owners of the lode discovered but a short  
time ago in Silver Lake district: "We made a  
clean-up last week of 1,300 ounces of silver from  
a run from our new mine. The ore mills fully as  
well as the ore from the Silver Moss, although not  
quite so rich. We are working one shift of  
two men on the Silver Moss, and it is looking  
well. The mines of this district never looked  
so well as now."—Butte Miner.

**THE CHANNEL TUNNEL.**—Operations con-  
nected with the submarine tunnel have already  
been commenced on the French side of the  
channel, several pits having been sunk to a  
depth of about 110 yards. At the same time  
the French and English committees have defi-  
nitely drawn up the conditions of working for  
the route. The property of the tunnel is to be  
divided in half by the length—that is to say,  
each company will possess half of the line,  
reckoning the distance from coast to coast at  
low tide. Each company will cover the expenses  
of its portion. The tunnel will belong to its  
founders. At the expiration of 30 years the  
two governments will be able to take possession  
of the tunnel upon certain conditions.

**GOLD AND PASSENGERS FROM SITKA.**—The  
steamship *California* arrived from Sitka on  
Thursday, bringing 100 passengers, and \$110,-  
000 in gold dust.

## Increase of Temperature with Depth.

A point connected with deep mining which  
has been much disputed is that relative to  
the increase of temperature with depth. The  
varying results attained by different experi-  
ments lead to the conviction that there is no  
fixed rule applicable to all localities and all  
classes of rock. That the rocks increase in  
temperature there is of course no doubt; but in  
what ratio this increase occurs is still a matter  
open for discussion. For the first 50 or 60 feet  
there is no perceptible increase; after that the  
increase of temperature becomes noticeable as  
depth is attained. But whether it is in the  
ratio of one degree for every 45 feet or one de-  
gree for every 73 feet is a disputed question,  
and the figure has been placed all the way be-  
tween these numbers.

The first persons to make systematic obser-  
vations and experiments on this question were  
Mr. Henwood, in Cornwall and Mr. Reich in  
Saxony. In a recent lecture before the Royal  
School of Mines, Prof. Smyth stated that the  
general average results of Reich's observation  
was that the depth corresponding with an in-  
crease in temperature of 1° Fah. was 76.26 feet.  
Mr. Henwood's experiments, and the lecturer's  
own experience, give the depth about 60 feet.  
The observations of Prof. J. Phillips at Monk-  
wearmouth colliery, gave 59.36 feet. The very  
careful experiments made by Mr. Bryham, dur-  
ing the sinking of the Rosebridge collieries (the  
deepest in England) where holes were bored to  
a depth of 3 feet into the rock at the sides and  
thermometers placed in and tamped, and al-  
lowed to remain for a time, gave as a general  
result in the lower part of the workings 51 feet  
for 1° Fah. In the Grenelle bore-hole the ob-  
servations presided over by Arago and other  
careful observers, gave the depth at 60 feet.  
At the deep holes at Creuzot, M. Malfredin  
found at one bore hole 56 feet, and in another  
43.1 feet. The latter, however, he supposes to  
be vitiated by the heat due to the friction of  
the borer, and we must also, in the bore-holes  
filled with water, remember that any heat in the  
lower part will cause upward currents in the  
water, and tend to equalize the temperature of  
the various parts. In the deep Prussian bore-  
hole at a depth of 4,040 feet the temperature is  
given at 38.5° Reaumur, which would give for  
1° Fah. a depth of 67 feet. Abnormal condi-  
tions will occasionally alter these rates consid-  
erably. At a depth below the surface of 30 to  
50 feet the temperature of the ground will be  
found to be invariable, and just equal to the  
mean annual temperature of the locality; hence,  
going down on a cold day, it appears to be  
warm, while on a hot day the air underground  
appears to be cool.

It is supposed by some that at a depth of  
2,000 feet the average rate of increase will  
decrease from what it was above. In a recent  
paper by Walter Rowley on "Deep Mining  
and Recent Engineering Achievements or  
Connections Therewith," published in the  
*Colliery Guardian*, he stated that this opinion  
is supported by the evidence of Monsieur  
Lambert, Government Inspector of mines  
for Belgium, who says that at the Simon  
Lambert colliery, at a depth of 3,489 feet, the  
temperature was only 78°, or an increase of 1° in  
119 feet. Calculations made in accordance with  
this hypothesis give the results tabulated below:

At 60 Feet Temperature=50° CONSTANT.						
From	Feet	Temp.	Feet	Temp.	Feet	Temp.
50 to 2,000	increase of	1	in 68	= 78	at 2,000	
2,000 "	4,000 "	1	" 75	= 104 "	4,000 "	
4,000 "	6,000 "	1	" 80	= 129 "	6,000 "	
6,000 "	8,000 "	1	" 85	= 152 "	8,000 "	
8,000 "	10,000 "	1	" 90	= 174 "	10,000 "	

If these conclusions turn out to be correct,  
the normal temperature at 4,000 feet will be  
about 104°, and about 152° at 8,000 feet. It  
may be possible to reduce the temperature at  
such an extent as to secure adequate ventilation  
at these great depths. Experiments made at  
Rosebridge colliery (the deepest in England) to  
a depth of 2,400 feet, as well as many on the  
continent, support this opinion. The normal  
temperature of the coal at the above colliery is  
93°, whereas the temperature is reduced at the  
face of the workings, to an amount varying from  
77° to 63°, according to the length of time  
exposed.

## The Patent Office.

A cotemporary, in a paragraph stating that  
the Patent Office at Washington is again in run-  
ning order after the late fire, says: "The Com-  
missioners have not attempted to maintain that  
the Government can avoid its responsibility to  
make good the losses of patentees, but they ask  
that these patentees shall restore, at their own  
expense, such models as were destroyed, believ-  
ing that it is to the advantage of the patentees  
to take upon themselves the restoration of the  
models, especially as they will thereby have the  
privilege of remedying defects and illustrating  
improvements discovered since the originals  
were patented."

This long sentence, apparently elaborated with  
care, conveys an entirely erroneous impression,  
and is calculated to lead inventors astray. Pa-  
pers which attempt to give information sup-  
posed to be of value to the inventors of the  
country, should be careful of their assertions,

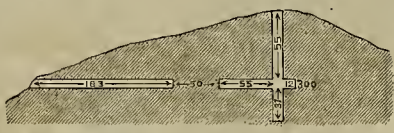
but we notice that in nine cases out of ten, such  
items are incorrect.

The truth is the Government simply stated  
that those inventors who desire to do so may  
restore their models to the Patent Office. There  
is no obligation to do so; but it is supposed that  
inventors will take the opportunity offered to  
replace their models. It is a guarantee of the  
authenticity of the patent, but inventors may  
exercise their own judgment as to whether they  
will stand the expense or not.

The concluding lines of the paragraph  
quoted above, are entirely wrong. It is foolish  
to suppose that inventors could be al-  
lowed "to remedy defects and illustrate im-  
provements" in their models. The models  
would have to be exactly as they were at first;  
that is, they would have to show the invention  
exactly as it was at the time the particular patent  
was granted. Any one at all familiar with  
patent matters would not have made such an  
assertion, which is foolish on the face of it.

## An Arizona Bonanza.

One of the richest and most extensive exhibi-  
tions of ore ever shown in San Francisco is now  
on exhibition at 405½ California street. The ore  
is from the celebrated Stonewall Jackson mine, of  
Globe district, Arizona, some 150 miles north-  
easterly from Tucson, and near the surveyed route  
of the 32d parallel railroad. This mine was re-  
cently sold by its original owners to San Fran-  
cisco capitalists for \$120,000 cash. But little  
work was done upon the mine until since the  
above sale, and, in fact, but little has been done  
up to the present time. The ore now on exhibi-  
tion—6,800 pounds, a little short of three and  
one-half tons—is estimated to be worth \$19,000  
per ton, or an aggregate of \$65,550. The ore,  
as will be seen by inspection, is literally full of  
metallic silver—the metal forming 60% or 70%  
of the entire weight. The only other form,  
aside from native, in which the silver appears  
is as a chloride, of which there is a large quan-  
tity. This ore was selected from a lot of about  
10 tons, which was taken from the shaft and  
drifts, as seen in the accompanying diagram.



By reference to the above diagram, which  
represents the actual work done in the mine, at  
the time this ore was shipped, it will be seen  
that the ten tons were taken from a shaft 92  
feet in depth, on the vein, which, with the  
drifts, aggregate 300 running feet. This is a  
very small amount of ground from which to  
obtain such results. The work at the same time  
proves very conclusively the value of quite an  
extent of ground above, and in near proximity  
beyond and below the drifts. Of course no one,  
however experienced, can do anything but guess  
at the continuance and richness of the vein.  
But its great uniformity over so much space, as  
prospected, with no evidence of "pockets" or  
"deposits" furnishes very good evidence of its  
continuance both in extent on the line of the  
vein and in depth.

The vein is very narrow, but never, so far,  
found broken, and varies from three to nine  
inches in thickness. The ore came up in iron-  
strapped boxes. A force of men are still ac-  
tively at work in the drifts, and as soon as a  
connection can be made between the 55-foot  
gallery and the tunnel which is approaching  
from the bottom of the hill, to give air to the  
shaft, men will be set to work sinking the shaft  
still deeper. The parties owning the mine will  
prosecute the work of development as rapidly  
as room can be found for men to work. The  
principal owners are C. H. McDermott, Michael  
Tierney and J. M. Martin—the latter a resident  
of Santa Rosa. The Superintendent and the  
gentleman now in charge of the ore on exhibi-  
tion is Mr. H. S. Jacobs. This display will  
no doubt add much to the already high estimate  
which is placed upon Arizona as a mining  
region. We hope the fortunate owners of the  
Stonewall Jackson may, in the early future,  
as present appearances indicate they will, de-  
velop a bonanza equal or superior in value to  
that of world-wide celebrity which is now being  
worked on the Comstock.

**BULLION SHIPMENTS.**—Since our last issue  
shipments of bullion from the prominent mines  
have been as follows: Martin White, October  
20th, \$14,285.47; Raymond & Ely, 22d, \$10,-  
095.90; Con. Virginia, 24th, \$190,649.87; Cali-  
fornia, 24th, \$194,278.27; Manhattan, 25th,  
\$11,339.90; Standard, 25th, \$40,162.33; North-  
ern Belle, 25th, \$4,963.27; Day, 26th, \$10,-  
512.00; Modoc, 26th, \$3,727.60; Con. Virginia,  
27th, \$113,768.32; California, 27th, \$199,941.70;  
Grand Prize, 27th, \$14,500.00; Endowment,  
27th, \$2,352.57; Arizona, 27th, \$1,908.46;  
Northern Belle, 28th, \$3,653.36; Leopard, 29th,  
\$4,400.00; Alps, 29th, \$1,835.00; Grand Prize,  
31st, \$17,000.00. Gold Hill, October shipments,  
\$11,500.00.

The Manhattan company will, after this date,  
charge, for reducing ores, \$35 per ton, allowing  
in bullion 80% on ores, the assay value of which  
is \$400 per ton or less, and 52% on ore of a  
higher grade.

## The Mining Share Market.

The past week has been a disastrous one to  
holders of mining stocks. In the face of un-  
usually favorable news from the mines, the  
prospect for a good crop year, the revival of  
general business in this city and the abundant  
supply of capital at the banks, the stock market  
has made one of those unaccountable and un-  
avoidable plunges toward bedrock which have  
been so disagreeably frequent during the past  
year. Public confidence has been so completely  
undermined by the recent policy of stock mag-  
nates that at the least symptom of a decline  
there is always the same precipitate rush to sell  
at any sacrifice. In this case, the slow and  
steady decline of the preceding week was  
changed into a veritable panic by the hursting  
of the pool on Exchequer and Bullion. These  
stocks were dumped upon the market in quan-  
tities which it was impossible to absorb; sales of  
Exchequer in the San Francisco Board alone on  
Wednesday, reaching over 25,000 shares. The  
market for some time has hinged upon these  
and the other stocks controlled by the Schultz  
management, and the terrible break of nearly  
75% in the leading speculations carried the val-  
ues of all other stocks down in sympathy. There  
is little doubt that the pool movement has been  
altogether a losing operation to those who were  
engaged in it, but then that is small consolation  
to the hundreds of lesser shareholders who have  
been ruined by the panic. An attempt had  
been made to uphold the prices of Exchequer  
and Bullion at a point which the mining and  
speculative prospects did not warrant. After  
forcing quotations to a tolerably high figure it  
was found impossible to unload more than a  
certain percentage upon the public, and the  
bears, taking advantage of the situation, broke  
in upon the pool and utterly routed it, bringing  
at the same time disaster to the whole list of  
mining securities. All the Comstocks suffered  
severely, those of the south and particularly so;  
while of the north end stocks Con. Virginia ex-  
hibited alarming symptoms of interest. The  
outside stocks sympathized in the decline to a  
certain extent, but not in proportion to Comstock  
shares. Toward the close of the week a slight  
reaction has set in, but quotations have by no  
means recovered their status of a fortnight ago.  
The main hope of the bull party is in the fact  
that the market, in two or three of the more ac-  
tive stocks, has been heavily over-sold. The  
attempts of the bears to fill their short con-  
tracts may have the effect of putting a better  
face on matters, even though the improvement  
be but temporary.

Meanwhile the great work of developing the  
mineral resources of the coast goes steadily on,  
without regard to the vicissitudes of the market  
or the unfavorable auguries presented in Mr.  
Del Mar's special report to the Silver Commis-  
sion. Active prospecting is being carried on at  
more points on the Comstock than ever before,  
and prospects in several instances are encour-  
aging. A new departure has been made by the  
Crown Point company in returning to the old  
abandoned upper levels and prospecting them  
at places long ago given up as offering no prom-  
ise of ore. The search has been rewarded by  
the uncovering of a large deposit of low grade  
ore, and in the Belcher and other neighboring  
mines the same policy is about to be introduced.  
The Savage and Hale & Norcross are at last  
sensibly gaining on the water. The great  
bonanza looks as well as ever, and the outside  
districts are promising well. There is, there-  
fore, no cause for the decline in the value of  
shares except that people have lost all confi-  
dence in the ability of the market to completely  
recuperate. Some time, of course, there may  
be a repetition of old-time activity, but not un-  
til a different disposition prevails.

**NEW FURNACES.**—A correspondent of the  
*Salt Lake Tribune*, writing from Sandy district,  
says: Wm. Tudingham has completed the  
erection of two new and substantial furnaces  
for the Mingo smelting company, which will be  
in running order by the first of November at  
farthest. In a short time he is to engage in the  
building of two large roasters, under the im-  
mediate supervision of Mr. Knapp, the Superin-  
tendent. Then two new stacks added to the  
two so successfully running for the last year,  
will keep Sandy floating through the present  
stagnation successfully. I am credibly informed  
that the Mingo company, on account of the low  
price of lead, have been compelled to make a  
reduction in the wages of their men. Furnace  
men are reduced 50 cents, feeders 75 cents, and  
helpers 25 cents. Outside labor is continued at  
the same rate, \$2 per day. Though this cutting  
has affected some, yet the public will see that  
the Mingo company have used good judgment,  
and studied well the laborers' interest by not  
reducing him any. A man cannot support a  
family and clothe them for less than \$2 per day.  
Other companies think differently, as they have  
already given them the lash to \$1.75. Compa-  
nies should be cautious in compelling men to  
work at starving rates.

A LARGE tract of rich oil land was discovered  
last week about 12 miles northwest from San  
Buenaventura, and already 8,000 acres have  
been located by the citizens. Green oil of ex-  
cellent quality is found in large springs. The  
owners will at once start two or three prospect-  
ing wells.



## HYDRAULIC MINING IN CALIFORNIA.\*

No. 4.

[By Ato. J. BOWEN, Jr., A. B., Mining Engineer.]

## Riffles

Square blocks of suitable length and breadth, eight to 12 inches deep, called riffles, arranged with spaces of one to one and a half inches between each cross row, are used to line the bottom of the sluices. They are held in position by small boards one and a half by six inches, fastened crosswise on the bottom between the rows by means of headless nails, and made secure by a cleat one and a half by three inches, nailed longitudinally on top of the blocks on both sides of the sluice. This method of setting riffles is falling somewhat into disuse. Block riffles are now frequently set and held firm in position by means of soft pine wedges driven between the blocks and the sides of the sluice. When wedges are used it is necessary that the sides of the blocks should be square where they adjoin one another. A side lining is required in all sluices. In cement claims, blocks four inches thick 18x24 inches in size are used for side lining.

In many localities round stones, instead of blocks, are used for riffles, and where heavy cement is washed these are considered preferable on account of their cheapness. At Smartsville they have been found to serve fully as well as the blocks, and are claimed to be cheaper. It must, however, be stated that they are more costly to handle, as longer time is required to clean up and repave the sluices when they are used. In some sections of the State longitudinal riffles are preferred, i. e., riffles made of scantling placed lengthwise in the sluice. It is frequently the case that the several kinds of riffles are used in long sluices. Where the banks contain many large boulders, as at the Paragon mine, a different style of riffle has been introduced. These riffles are made of 6-inch scantling, one and one-half inches wide, eight feet long, separated by blocks one and one-half inches wide, and an iron bar one and one-half inches wide, one inch deep, and eight feet long, is fastened on top of each scantling. The grade of these sluices is 18 inches per 12

feet lower end. Riffles, 1 by 4 inches lumber, covered with strap iron, rails 1 inch apart.

## Loss of Quicksilver.

In hydraulic mining a loss of quicksilver cannot be avoided, the amount lost depending on the character of the gravel washed, the quantity of water used, the grade, length, and condition of the sluices, and on the number of days run. The use of a long line of sluices, kept in good order, and the employment of undercurrents, tend to diminish it.

The aggregate amount of quicksilver lost at the La Grange hydraulic company's mines during a period of two and one-half years in running six claims, 1,520 days (24 hours), washing and moving 2,275,967 cubic yards of gravel, and using 1,533,728 inches of water (2,159 cubic feet each), amounted to 553.75 lbs. quicksilver. The North Bloomfield claims for the year ending November 3, 1875, used 464,600 miner's inches of water, and 9,649 lbs. of quicksilver were employed in the sluices. The loss of quicksilver at the respective claims was as follows:

Name of Claim.	Miner's in. used.	Length of Sluice, Feet.	Loss of Quicksilver, Lbs.	Per cent.
No. 8.....	380,972	1,500	900	11
Woodward.....	51,556	400	217	25
Eisenbeck.....	20,000	400	125	25

The losses at the Woodward and Eisenbeck claims are attributed to old and poor sluices and steep grade. For the year ending October 31, 1876, the loss of quicksilver at the above mentioned claims was as follows:

Name of Claim.	Miner's in. used.	Length of Sluice, Feet.	Loss of Quicksilver, Lbs.	Per cent.
No. 8.....	700,000	1,800	2,251	
Woodward.....	36,000	600	123	
Eisenbeck.....	56,300	400	182	

## The Loss of Gold.

The loss of quicksilver would seem to involve a loss in gold, but it is practically impossible to determine to what extent this is the case. There are many conflicting opinions as to the amount of fine floured and "rust" gold lost in hydraulic mining, but in properly constructed sluices the already known appliances, when used, save all that can at present be economically and profitably caught.

The third undercurrent was 91 feet distant from the second undercurrent, with a drop of 50 feet between them. Its yield was nearly \$500.\*

It sometimes happens that 100 or 150 feet at the head of a sluice are covered with gravel during the greater part of a run. In such cases the gold is found so much further down the sluices. In the North Bloomfield tunnel, the upper 300 feet of the sluice is generally filled with gravel, from one to five feet deep, and still this portion yields much more amalgam per linear foot than the next 300 feet of the sluice below.

From the report of this company for the year ending October 31st, 1876, the following data and facts are worthy of note, as showing the position of the gold as cleaned up in the sluices at No. 8 claim, where some 700,000 inches of water were run, washing 2,919,000 cubic yards of gravel.

Sample.	Yield of sluices, \$	Per cent. of gross yield.
Flume (1,800 feet).....	170,900 73	92.66
Tunnel below flume.....	7,200 00	3.75
Tail sluice (300 feet).....	1,300 00	.95
Undercurrents.....	5,235 00	2.50
	\$162,735 73	100.00

## The Distribution of Gold in Tail Sluices.

The North Bloomfield tunnel (8,000 feet in length) has 1,800 feet of sluices, paved with blocks, at its upper end, but in the succeeding 6,200 feet no sluices are used, the tailings being allowed to run on the bare bedrock (a tough slate).

From the rock cut at the mouth of the tunnel a sluice paved with rock receives the tailings. From here on they are carried through sluices and cuts, distributing them over undercurrents set on different grades, paved in some instances with rocks and blocks, and occasionally arranged with longitudinal riffles covered with strap iron.

The grizzlies used are made of wrought iron, one by four inches in size, set on edge.

The discharge from the several undercurrents is taken up by the main sluice, and subsequently discharged over the succeeding undercurrents, till the lowest sluice and undercurrent finally discharge the tailings into the canyon. From Dec. 1st, 1876, to June 1st, 1877, 350,000 24-

A yielded	Oz. amalgam	
B " "	5	
C " "	8 1/2	1 clean up
D " "	5	
Chute yielded	6 1/2	
Total.....	25 oz.	\$150

No. 6 Undercurrent.—Size, 24 by 30 feet; grade, 17 inches to 12 feet; rock riffles; chute, 2 1/2 feet upper end, 2 feet lower end. 150,000 miner's inches of water.

A yielded	Oz. amalgam	
B " "	8	
C " "	5	1 clean up.
D " "	3 1/2	
Chute yielded	3	
Total.....	19 1/2 oz.	\$115

The total yield of the undercurrents and tail sluices for the period mentioned was \$7,872, whilst the total yield of the claims was \$145,000.

The amalgam from the main sluice is worth from \$7.50 to \$8.50 per ounce, whereas that of the undercurrents varies from \$6 to 6.20 per ounce. The following statement shows the result of the of the undercurrents and tail sluice clean ups for the year 1876-7.

Cut A to B.....	Oz. amalgam.
Tail sluice B to C.....	1364
Undercurrent No. 1.....	643 1/2
Undercurrent No. 2.....	280 1/2
Undercurrent No. 3.....	253 1/2
Undercurrent No. 4.....	143 1/2
Undercurrent No. 5.....	69
Undercurrent No. 6.....	50 1/2
Total in Canyon.....	\$3,170 oz.

This amount (3,170 oz.) equals about 7% of the total clean up of the mine for this last fiscal year, during which period 595,000 miner's inches have been used, extracting \$290,834.47 gold.

Comparing these final results with those of the previous year (1875-6), the precious metal is found distributed throughout the sluices and undercurrents with the same relative proportion. This fact is especially worthy of note, since last year the bulk of the material moved was "top gravel," whilst this season a much larger proportion of cement gravel has been run through the sluices.

In the heavy cement at French Corral and Manzanita a high percentage of the gross yield of the mines is found in the undercurrents. The most efficient means of saving gold from cement

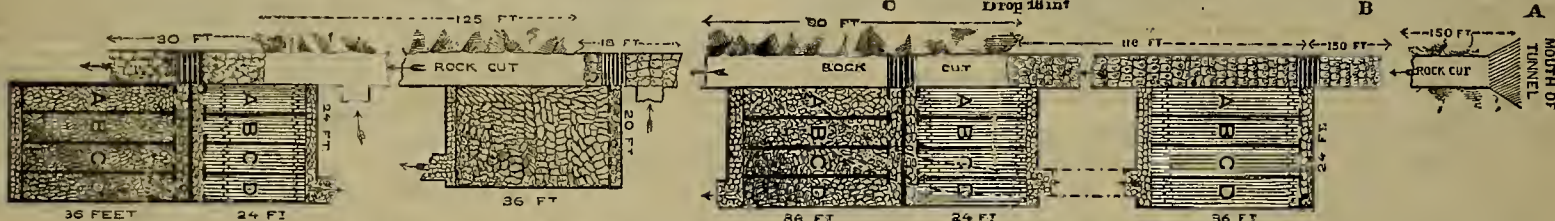


DIAGRAM SHOWING THE GENERAL ARRANGEMENT OF TAIL SLUICES AND UNDERCURRENTS.

foot box, and the width of sluice is 44 inches.

A system of riffles consisting of a row of blocks alternating with an equal section of rocks has been found to work successfully. This arrangement of the sluices materially reduces the wear and tear of the blocks, and has given excellent results. The block and rock riffles are not desirable for those sluices which have frequently to be cleaned up.

So far experience shows square block riffles to be the best for saving gold. The objection to their use is the cost of wear and tear. The most economical substitute is rocks, but sluices set with them require steeper grades and more water than those arranged with blocks. As a matter of convenience and economy, block riffles should be used in the head sluices of those claims where the gravel is rich, or where a large amount of gold is monthly produced and cleaned up.

## Charging the Sluices.

When work commences, the sluices are run half a day in order to pack them. A few moments before the quicksilver is added the water is run clear, and they are then charged. More quicksilver is added during the second and third days, the quantity being increased until the riffles hold the mercury at the surface. During the washings the sluices are repeatedly examined and recharged. The amount subsequently added is regulated by the quicksilver exposed to view; the total quantity required is more or less dependent on the length of the run. When charging the riffles all splashing of the quicksilver should be avoided. When it is sprinkled into the sluice (a practice to be condemned), it divides itself into minute particles, the bulk of which is easily carried off by the swift stream, while portions of it will even float in the clear water. The buoyancy of these small particles is very considerable.

Float quicksilver containing gold particles has been taken from off the surface of the water 20 miles from where the amalgam entered the stream. An instance of floating amalgam was observed on the north fork of the Yuba river. At a point four miles below where tailings were dumped, a flume (conveying water to a pump) was set 10 feet above the bottom of the stream, drawing direct without any dam. An examination of the flume, subsequent to its re-

work done at Gardner's Point during the last four years. The number of inches of water used at this claim during this period is not known. The number of cubic yards of gravel moved has been approximated from the best obtainable data, and an inspection of the property. From 1872-74 inclusive, about 143,000 cubic yards of dirt were moved. In 1875 the claim was only run 14 days full time. This year (1876) 40,000 cubic yards of gravel and 260,000 cubic yards of lava ashes were washed off. The gross yield from 1872-76 was \$140,000. The number of cubic yards of gravel moved during the corresponding time is sufficiently large to warrant the generalization that the present known appliances for catching gold are adequately effective.

## The Result of Working Tailings at Gardner's Point.

The tailings from all these washings were caught and confined in a ravine situated a short distance below the claim. The length of the sluice through which the gravel passed was 1,373 feet, with three undercurrents. This year the ravine, supposed by many to be exceedingly rich, was cleaned up on joint account by Chinese, under special engagement with the owners, and its gross yield was \$1,168, not 1% of the total receipts from the washings.

## On the Distribution of Gold throughout the Sluices.

In cleaning up sluices, the largest proportion, approximating 80% of the gold caught, is found in the first 200 feet of the head of the sluices. The gross yield of the Gardner's Point claims for the season of 1874 was \$68,000 for 100 days' run. Of this amount \$54,000 was obtained in the first 150 feet of the sluice, and \$3,000 taken from the undercurrents. The remainder was found lower down along the sluices. The first undercurrent was 790 feet distant from the head of the sluice, and yielded 50% of the total yield of the undercurrents. The second undercurrent was 78 feet distant from the first, with a drop of 40 feet between them, and it contained 33% of the gross undercurrent yield.

\* This occurred in 1864. The flume was owned by Mr. Banks, of San Juan, Nevada county.

† The aggregate number of days' work of all the claims.

‡ Each of these inches discharged 2,236 cubic feet of water per 24 hours.

Mr. P. Wright, Assistant Engineer for Water Supply, Beechwood district, giving his experience on this subject says that, "with a sluice 12 inches wide on an incline of one foot to 48 feet, using 600 gallons per minute, I have found 65% of the gold within three feet of where the gravel was filled into the sluice—where the gold was lying upon a smooth board, and yet a powerful current failed to move it."—*The Gold Fields and Mineral Districts of Victoria*, R. Brough Smyth, p. 185.

hour miner's inches of water (2,230 cubic feet each) conveying the tailings, passed through the tunnel, and were discharged through the tail sluice and undercurrents.

The annexed sketch shows the general arrangement of the tail sluices and undercurrents, which latter were subdivided into compartments as shown.

The distribution of the gold along the line of sluices and in the several undercurrents was as follows:†

## Tail Sluice, etc., from Dec. 1, 1876, to June 1, 1877.

Miner's inches of water, 24 hours each.....	\$50,000
150 feet at head down to No. 1 undercurrent, yield.....	\$3,150 00
150 feet remainder of sluice.....	\$50 00
Total.....	\$3,500 00

No. 1 Undercurrent.—Size, 24 by 36 feet; grade, 13 inches to 12 feet; chute, 2 feet wide at opening, contracted to 10 inches; iron rail riffles.

A yielded	Oz. amalgam	
B " "	108 1/2	
C " "	80 1/2	
D " "	40 1/2	3 clean ups.
Chute yielded.....	31 1/2	
Total.....	310 1/2 oz.	\$1,920

No. 2 Undercurrent.—Size, 24 by 24 feet; grade 12 inches to 12 feet; chute, upper end 2 1/2 feet, lower end 2 feet; iron rail riffles.

A yielded	Oz. amalgam	
B " "	48 1/2	
C " "	30 1/2	
D " "	15 1/2	2 clean ups.
Chute yielded.....	23 1/2	
Total.....	143 1/2 oz.	\$874

No. 3 Undercurrent.—Size, 24 by 36 feet; grade 16 inches to 12 feet; chute, 2 1/2 feet upper end, 2 feet lower end; rock riffles.

A yielded	Oz. amalgam	
B " "	50 1/2	
C " "	35 1/2	
D " "	15 1/2	2 clean ups.
Chute yielded.....	16 1/2	
Total.....	123 1/2 oz.	\$883

No. 4 Undercurrent.—Size 20 by 36 feet; grade, 12 inches to 12 feet; rock riffles.

71 1/2 oz. amalgam.....\$436

No. 5 Undercurrent (constructed in March).—150,000 miner's inches of water; size, 24 by 24 feet; grade, 12 inches to 12 feet; chute, 2 1/2 feet upper end, contracted to 2

\* The figures showing the yield of the undercurrents were calculated from the amalgam.

† I am indebted to Mr. H. C. Perkins, Superintendent N. B. M. Co., for the data given. The results show the total yield of the many places, the number of "clean ups" being noted in each case.

‡ 700,000 miner's inches water used in 1875-6, the yield was \$1,800.

## PROCURING PATENTS FOR MINING CLAIMS.

—Our readers will see in another column of this issue a notice of a new enterprise which Dewey & Co. have lately undertaken—the procuring of patents for mine and mill claims. This is an enterprise that for a long time many have felt the need of, and now that it has been undertaken by such a responsible firm, it is to be hoped that all locators will appreciate the advantages which they will derive from it, and give it their patronage. Too much stress cannot be laid on the advantage that Dewey & Co. possess in the fact that they have persons in Washington who will attend promptly to all applications and see that they receive immediate attention from the Commissioner; for every one knows how much more likely all applications are to receive immediate attention if presented by a person familiar with official business. Messrs. Dewey & Co.'s peculiar advantages for the successful accomplishment of this undertaking cannot but be appreciated when we consider their already large business with the department. This branch will be under the supervision of Mr. J. L. Boone, Esq., attorney at law, one of the members of this firm, who is well known on this coast and in Washington as a thorough and competent patent attorney.

THE DEXTER MILL.—The Butte Miner says: Now that the Dexter mill has passed into the hands of Mr. Clark we may look for a resumption of work at an early date. In fact, that gentleman informs us the works will be in operation in a week or ten days. Some repairs to the machinery are necessary, and when these are made we shall hear the joyful sound of the pounding stamps. We are all well aware what effect the stoppage of the Dexter mill has had upon the camp in various ways. The prospect is now good for a continuous and successful run for months, perhaps years, and the mining industry of the camp and the business condition of our town will receive immediate impulse. We feel confident in saying that the majority of our people are well pleased to know that the property is in the hands of so competent a person.

\* A paper read before the American Institute of Mining Engineers of the Wilkes-Barre meeting, May, 1877.

† The primitive riffles used by the South American gold washers, consisted of steps cut in the bare bedrock. Blankets and grass sods were also used to catch the gold. See detailed description of the gold washings of Jaraguá, "Manc's Travels," pp. 77, 78.

‡ The term cement is applied to a conglomerate which is chiefly cemented together by ferric oxide.

§ The gold particles were microscopic.



## Meat Packing and Compressing.

We have many columns on fruit shipping and drying, and on the methods employed for transforming milk into merchantable products. It came into our mind the other day that we were overlooking the progress which is being made in giving the meat surplus of this coast a permanent form, by the aid of which it may find its way to distant consumers. This special line of our industrial advancement is just as important to our stock and swine growers as the drying of fruit is to the orchardist, and we are pleased to announce that our investigation of the subject has put in our possession much interesting and valuable information. In a general way we can state that our city meat preserving establishments are extending their business and improving their facilities in a manner which promises increased demand for the raw material of the stock grower, and thus warrants breeders in putting forth renewed exertions for the improvement of their live stock and their pastures.

In the line of packing there has been great improvement of late, both in the quality of the goods produced and in securing markets for them. It is true that for a long time California salted meats had a poor reputation, and this was owing greatly to the fact that supplies came from retail butchers, who put down their unsalable meat to save it from waste, and thus put upon shipboard a sort of a refuse product, packed without the skill gained by special experience and without proper care in curing. So long as this system prevailed it was little to be wondered that California packed meats were in ill repute and declared greatly inferior to the product of the Eastern packing establishments. When the regular packers began operation in this city, there came into market a new style of goods, which has steadily won its way until, as noted in our market review last week, Wilson, Merry & Co., of this city, have won a crowning victory over Eastern packers by securing a contract to furnish 250 barrels of California packed beef to the U. S. navy. It is a matter of interest, as part of the history of the industries of this coast, to record the steps by which this victory was won for California beef. At first the naval authorities at Washington protested against the danger of supplying the ships with untried material and hinted at the mutinies, etc., which would break out on the ships if the meat should prove poor. Captain Merry responded that he wished no dangerous experiments of this kind, but merely asked that a few barrels of the California product should be put on shipboard and sent to the far away stations and subjected to a two years' test. By the aid of Senators Sargent and Booth this concession was granted by the authorities, and barrels were sent to the South Pacific and North Pacific squadrons and to China. The results of this test, and the judgments which were finally pronounced by the officers ordered to make the trial, etc., may all be inferred from the fact that the second navy contract for 250 barrels of California beef has been executed.

Another gratifying indication of progress which we would mention in this connection, is the uprising of a new industry which promises to prepare large quantities of California meats for export to distant consumers. It is the manufacture of compressed meat. This meat comes upon the market in neat tins of different sizes, and is so prepared that all the eater has to do is to slip out the contents of the can upon a plate and take up his knife and fork for a meal. The process of manufacture in this city is the same recently introduced in the Eastern canning establishments, by which the meat is slightly corned, then cooked and compressed into tins which are finally subjected to what is known as the vacuum process. This method makes a shrinkage of about 60% from fresh weights, but as all the bones, sinews and surplus fat is taken out in the process, the result is much more desirable meat than that heretofore packed as fresh meat, cooked by roasting and otherwise. This manufacture is now carried on in this city by four firms: Wilson, Merry & Co., the Cutting Packing Company, Sol. Wangerheim & Co. and Fenssler & Birgham. The product now packed annually is about 3,000,000 pounds, and the business is increasing rapidly. The material used is chiefly beef, but compressed mutton, ham and deviled ham are also produced. The market for these meats is chiefly found in our interior mining trade, for shipping and export and for naval use. Wilson, Merry & Co. have supplied two contracts to the French navy and have the highest testimonials of quality and durability. In general it may be said that the quality of California compressed meat is pronounced by experts fully equal to any made elsewhere, and frequently superior, as the price of beef here admits of using parts of the animal which cost too much at Eastern points, because the demand for these parts for local consumption takes all that are offered at high prices.

The most gratifying feature of this trade to us, and must be to all producers of meat supplies, is that due attention is being paid to enterprises for profitably using our surplus grazing products. Upon these the future of our live stock interests must depend in a large degree, and, if just transportation rates can be secured, it will not be long before the provisions, which we can produce more cheaply than our Eastern competitors, will soon secure for us the mastery in the markets of the world.—*Rural Press.*

## Sale of the San Juan Mines.

The *Silver World* says: The heaviest sale of mining property recorded in San Juan was made this week by Brookover, Wright & Co., who sold the celebrated Wheel of Fortune lode, together with the noted lodes—Mark Twain, Grand Trunk, Monetizer, Mountain Queen and Prospector, six in number, all located upon Mt. Sneffels, for the snug sum of \$160,000. The purchasers are Byron J. Smith and Abram G. Hoyt, who have been for some time interested in mining operations in Burrows park, being the owners of the celebrated American Eagle and other well known lodes in that district. The transaction is *bona fide* and a strictly cash one, the money being paid down. The Wheel of Fortune is considered the best developed, as it is one of the richest mines in San Juan. The mineral is chiefly ruby silver. The Monetizer, Mountain Queen and Prospector are extensions on the same vein. The Grand Trunk and Mark Twain are cross lodes, and are mammoth veins, carrying galena rich in gray copper.

The recent owners were Messrs. Brookover, the Wright Bros., Mason Greenlee and S. H. Crowell. The Wright Bros. have taken a contract to work the property for the purchasers. The other members of the former company take their share of the cash and elect to spend a portion of it in enjoying themselves at their old homes, and passed through here Thursday en route for the East.

The fortunate purchasers are gentlemen of wealth and enterprise. They know they have a fortune in their purchase, and they propose to develop the property and take out a few of the thousands in sight—it is estimated by good judges that there is at least \$200,000 worth of ore in sight in the Wheel of Fortune alone.

WOODWARD'S GARDENS has the following new attractions: The buffalo chase; large whale skeleton; new museum; improvements in the zoological department, besides the other features which have made it popular.

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Comprising a Practical Exposition of the Various Departments of Exploration, Mining, Engineering, Assaying, and Metallurgy,

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## HOW TO ADVERTISE.

The following views of some of our most successful business men, says an exchange, will be very generally concurred in:

"The tawdry lithographs so freely used by certain manufacturers neither express good sense nor good taste; they suffer even by comparison with the comic valentine, for although the latter is essentially vulgar, and frequently a hurtful missile in the hands of a foolish or a malicious person, it means something; it has about it some touch of humor—it tells for what it was designed. But the stove manufacturers' valentine, I mean the red and yellow lithograph, has no redeeming qualities about it. At best, it but announces the thoughtlessness or want of dignity of its author; and if it does not hint with a certain degree of positiveness at the probable inferiority of his wares, it is less injurious than I have been inclined to regard it."

"Fence advertising cannot be too emphatically condemned; to characterize it as vile is scarcely to do it adequate justice. It is primarily objectionable, because it brings the manufacturers who wish to advertise into doubtful company on the public highways; and every prudent business man must know, if he has given to his advertising the careful attention it deserves, that the money devoted to papering fences is utterly wasted. We know a landowner who expends \$150,000 annually for advertising, but you cannot find his name on the fences; he is the best advertiser in the country, but there is nothing comical or grotesque about his way of doing business."

"The glaring poster neither inspires confidence nor conveys the information the public desire; and if we would make the best possible use of our money in giving publicity to our claims as manufacturers, we should patronize able and responsible newspapers. The newspaper is immeasurably the best medium open to our trade; the most liberal and expert advertisers testify to its value; and in the employment of its columns we would find a means of escape from the wasteful, undignified and ineffective methods to which so many now resort in their eager desire to secure attention and patronage."

TESTING AND WORKING SILVER ORES.—This is the title of an illustrated work of 114 pages, for Miners and Prospectors, by Chas. H. Aaron, published by Dewey & Co. It is written for miners, in plain language, and with all necessary details in description. The author describes the different processes of roasting ores, the appliances, methods of testing ores, testing for a process, working samples, treatment of base metals, use of chemicals, leaching processes, different kinds of crushing apparatus, etc. This little work abounds with useful hints to miners and prospectors, and is written in a practical style. Price, post free, \$2.00. Address, Dewey & Co., Mining and Scientific Press, 224 Sansome St., San Francisco.

KUSTEL'S CONCENTRATION OF ORES (of all kinds), including the Chlorination Process for Gold-bearing Sulphurets, Arseniurets, and Gold and Silver ores generally, with 120 Lithographic Diagrams, 1867. The most complete treatise. Published at this office. Price, \$7.50. Postage, 50 cents extra.

ROASTING OF GOLD AND SILVER ORES, and the Extraction of their Respective Metals without Quicksilver, 1870. It contains 142 pages, embracing illustrations of furnaces, implements and working apparatus. Price \$2.50 coin, or \$3 currency, postage free. Published and sold at this office.

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## HENDY'S \$1,000 CHALLENGE ORE FEEDER.

I call my Automatic Ore Feeder the \$1,000 Challenge, because I challenge the owners or backers of any other feeder to a competitive test for that amount. As Mr. O. G. Rodgers, Superintendent of the Oreen Mountain mine, near Oreenville, Plumas county, appears prominently as a detractor of the merits of my feeder, and seems confident that another one is better, perhaps he will accept this long-standing challenge which the owners of other patents will not, and give me an opportunity to prove publicly the superiority of my machine. As to Mr. Rodgers' assertion about my feeder wearing out, it is no less fallible in that respect than other machinery; but I have over 250 now in use, some of them for over two years, and have never had to expend 25 cents for repairs. The fact that my feeder received the premium at the late Mechanics' fair, and that I am shipping several feeders weekly to different parts of the country, is sufficient proof of the appreciation in which it is held.

As to my feeders having been thrown out of the Gold Stripe mill, they were not displaced for inefficiency, as the following letter will show, and it answers also as a complete refutation of Mr. Rodgers' statement:

OFFICE SUPERINTENDENT OF THE GOLD STRIPE O. M. CO., GREENVILLE, PLUMAS CO., OCT. 16TH, 1877.

JOSHUA HENDY, Esq.—Dear Sir:—Your favor of the 15th instant at hand. In reply to your inquiry as to the working of your ore feeders at our mill, we can say that there is no fault in the machines, and we consider them the best now in use. At present they are not in use with us, owing to the construction of the mill, which we are about to rebuild and make proper arrangements for putting in your feeders.

J. K. OWEN, Superintendent Gold Stripe Mine.

One of the principal owners of the Gold Stripe and Oreen Mountain mills is also largely interested in the Plumas National mine, where I have just shipped several feeders, showing the confidence placed in the machine by these gentlemen who have used it.

Now, if Mr. Rodgers is sincere in his belief as to the merits of a rival machine over mine, here is a chance for him to make a thousand dollars easily, if he can get the owners of the machine to lend him one for the trial, which is the only doubtful thing in connection with the matter. Mr. Rodgers' eight months' experience with both machines ought to give him confidence enough in his own convictions to accept the challenge offered to him, or any one else.

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Any such device is an infringement of United States Letters Patent, granted to me on the 16th of May, 1876, and re-issued September 10th, 1876.

I have commenced suit against Richard Hoskin for infringing my said patent, and intend to prosecute all parties using such Deflectors without license from me, there being no other way to protect my rights.

Any parties wishing to purchase the right to use this device can do so by making application to me.

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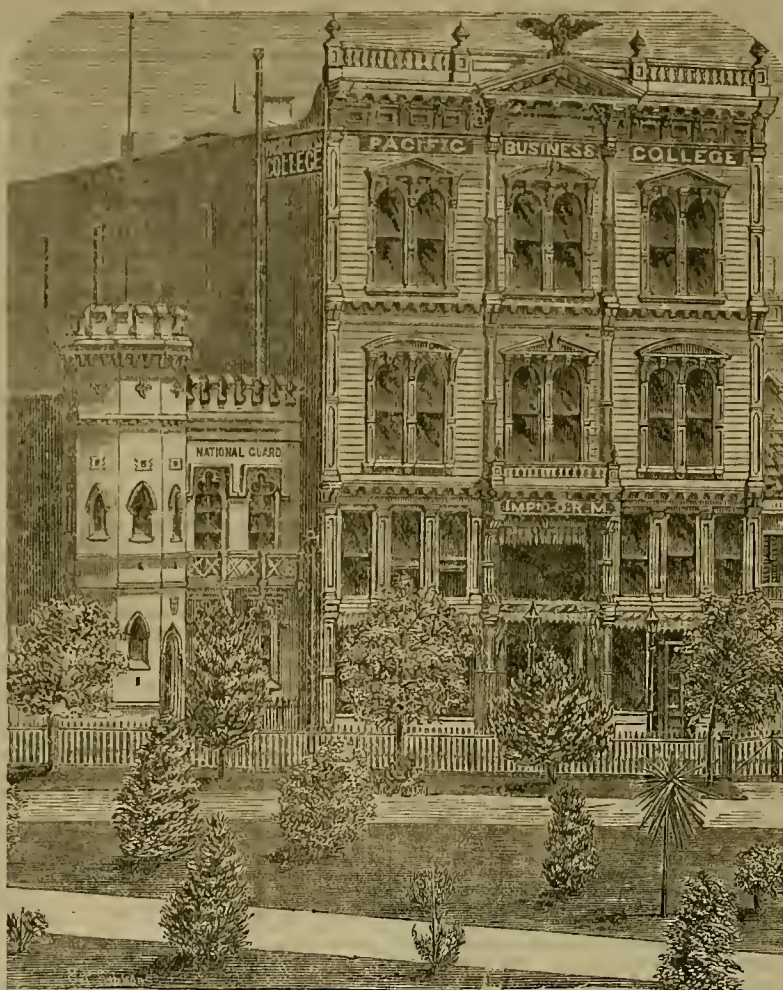
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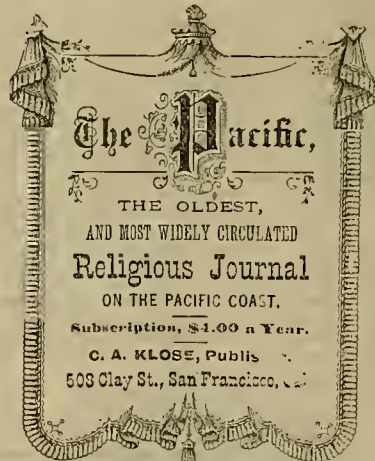
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## The Philosophy of the Hendy Concentrator.

(Written for the PRESS by CHAS. C. RUCKER, M. E.)

### Sifting Action.

There remains to be considered what has been termed the sifting action of the pan, to which the separation below the surface must mainly be ascribed, and which seems to me the most important action of the machine, because to it the separation of the finer sulphurets is principally due. It is known that well-sized, rocky substance occupy or fill 50%, globular grains 70%, grains or pieces of various size 62%, of the space which they apparently assume. This is proven, for instance, by the weight of a cubic foot of coarse quartz sand: One cubic foot of solid quartz weighs about 162 pounds, 62% of which is 100 pounds, which, on trial, will be found to agree closely with the weight of one cubic foot of sand answering the condition above stated.

This would indicate, then, that the spaces left between the particles of classed or sized sand, are about equal in volume to the sand itself. This would, of course, facilitate the downward motion of the heavier particles, which are approximately of equal volume as the spaces between the grains of quartz; their form, however, being different, the spaces will rarely be sufficiently large to admit the grain. But, of course, the larger the spaces, so much less the motion required to effect the conditions of free fall and displacement, necessary to separation, as above explained.

In the case of graded sand, we have the conditions necessary to leave only about one-third space between the particles, which, as has been said, occupy 62% of the apparent volume; the volume of the spaces is, therefore, about one-half of that of the particles themselves.

As has been stated above, the ratio of diameters of graded quartz and iron pyrites particles is as 1 to 2.5. This cannot, however, be strictly the case between each individual particle in the grade, as their size varies almost infinitely from each other, and the grading can only be regulated to confine these differences within certain limits, which do not exceed the equal size or the mean between the smallest particle of pyrites and the largest particle of quartz, nor the square of the normal ratio of diameters. The ratio between the diameters of the smallest grain of pyrites and that of the largest grain of quartz, would hence be as 1 to 6.25.

It has also been stated that the ratio of volumes between graded particles of iron pyrites and quartz is as 1 to 15.6, whereas the ratio between the spaces and the particles is as 1 to 2. The average space left between the grains of sand is, therefore, eight times as great as the average volume of the pyrites particles, or equal to a ratio of diameters of 2 to 1. It is evident, therefore, that in this case there is ample room and opportunity for the pyrites—or whatever the denser mineral may be—to work down between the sand, when aided by the shifting action of the water and the oscillations of the pan. The operation of Hendy pan may really, in this case, be termed a sifting in water of the denser particles, through a sieve formed by the particles of the less dense mineral, the only retarding agency being the cohesion of the particles, which, however, is not constant, because it is intermittently broken by the shifting of the sands, caused by the oscillations of the pan and the current towards the central discharge.

The very finest ore particles cannot, however, resist the floating action exerted by the rapid swinging motion of the water and sand, and will be kept in suspension and eventually carried out by the waste current through the central discharge.

### Advantage of Continuous Discharge.

It is easy to see that this continued sifting of the fine particles down into the spaces left between the coarser, must result in an increasing compactness of the mass towards the bottom, and a relative accumulation there of the finest products of separation. The immobility of the mass must keep step with the decrease of space, and gradually cause a packing of the sands in the bottom; and with this stoppage of motion, the density of the particles must also gradually cease to assert itself. A continuous discharge of the concentrates from the bottom of the pan counteracts this, somewhat, on account of the current towards the discharge hole resulting therefrom; but on account of the practical difficulties experienced in properly regulating such a continuous discharge, so as to suit other requirements of the general manipulation; the preference is still given to a well regulated but intermittent discharge, in many mills that use the pan successfully. No doubt a self-discharging device, free from the objections hinted at, would be a useful addition to the machine. This cannot be accomplished by any arrangement simply regulating the discharge orifice; it must regulate itself automatically, according to the accumulation of sulphurets in the pan. Such a solution has been attempted several times, but so far, not successfully, it seems.

### Review of Action.

If we briefly review the part which each of the actions described plays in the concentrating work of the pans, we see: That the centrifugal impulse arranges the sands according to their absolute weight, bringing within the same zone

particles of the dense mineral with larger ones of the less dense, at the same time elevating the surface towards the periphery.

The crank motion causes alternating periods of suspension and subsidence of the particles near the surface—notably at the periphery—which tends to bring the less dense mineral to the top; while on the deeper strata a sifting action is produced, allowing the passage downward of the smaller and denser particles, through the pores or spaces between the larger, lighter particles.

The less dense mineral thus brought to the surface is swept by the current down the incline to the central discharge, leaving the denser particles that have still been mixed with it near the periphery. The larger particles are affected most forcibly by this action, but somewhat retarded by the recurrence of centrifugal impulses.

With the accumulation of the denser mineral at the periphery, the conditions for discharge of the waste by direct displacement become more favorable.

### Conclusions.

That a machine acting on such a remarkable combination of correct principals, should be capable of giving a good result, cannot be surprising; but to do this the conditions must be fulfilled, which allow a sufficient development of such actions. This can only take place undisturbed in a machine properly made and set up and kept free of injurious vibrations; run at a speed properly adjusted to the qualities of the sand, and properly fed with pulp, together with a sufficient supply of water. The proper centrifugal action can only develop itself at a sufficient rapidity and scope of the oscillations, and a sufficient supply of water is very essential to an effective, yet not excessive discharge of the waste sands.

A most important aid to the attainment of the latter end is the new arrangement of pulp-distributing pipe, which being self-propelling, insures a regularity of feed, and a diagonal sweep of the water to the discharge, not attainable with the earlier arrangement, but very material to the successful working of the pan.

Of course the foregoing does not represent fully or correctly the details of the action of the Hendy pan; it is merely an imperfect theoretical outline of those agencies and conditions which are mainly instrumental in effecting separation, by the working of simple and well known mechanical laws. An attempt at complete consideration of the auxiliary influences that affect its working would lead too far, and would also be useless, for the most elaborate theory could not be made to conform entirely with the results of practice, because the conditions are necessarily indefinite, on account of the almost infinite variety of form and composition in the particles operated on.

In the main, however, the explanation is correct, because it is founded on facts, and it is also borne out by actual experiments.

### Condition of the Concentrators.

That a clean concentration cannot be expected at the first operation in the pan will be readily understood when it is considered that there is nothing to prevent the sifting downward of the fine sand except the displacing action of the denser particles, which avails only in so far as it takes effect on particles of equal or greater size. The bulk of the sand, separated with the sulphurets in the first pans will, therefore, be as fine as the sulphurets themselves; its displacement is impracticable, because coarse sulphurets will discharge with the waste before the accumulation is sufficient for displacement. With ore containing 2% to 3% sulphurets, the concentrate from the first pans will yet contain 70% to 75% sand by volume. By running these concentrates together into a lower pan, reworking them, the conditions for displacement are fulfilled, and a very clean product obtained by allowing the pan, when filled with second concentrates, to run some time without feed, but with clear water alone, so as to give the last portions of admixed sand an opportunity to work off. As long as the feed is continued, not even the second concentrates will be obtained clean, except by a well regulated continuous discharge, and a previous separation of the coarser sand.

### Loss of Sulphurets.

It is not difficult to understand that the loss of sulphurets from the pan, under these conditions is composed mainly of very fine sulphurets, which are kept suspended by the agitation, and are swept out of the discharge before they have time to settle in the less agitated central portion of the pan; on the other hand, the coarse sulphurets, working to the top at the periphery, are rolled down the incline to the discharge. In a number of carefully made panning tests of waste from the upper Hendy's coarse sulphurets were found to compose one-third to one-half of the whole amount panned out, the rest being mostly very fine. This condition is most apparent in the waste from the second pans, from which the loss is, of course, proportionately greater, the material fed being about ten times as rich as that fed into the first or upper pans.

### The Influence of Grading.

The foregoing naturally leads to the conclusion that by separating from the battery pulp the coarsest and the finest particles, and treating each under conditions most favorable to separation, the intermediate sands would be concentrated with more success in the Hendy pan than the mixed sands.

The simplest way to accomplish this would,

no doubt, be that of grading or assorting the sands by their speed of fall in flowing water. As already explained, the result of this work is the separation of the particles in a certain ratio of diameters to density. The coarsest particles of sulphurets and quartz would be found in one grade, the average size of the particles answering to the formula:

$$\frac{\text{diam. A.}}{\text{diam. B.}} = \frac{\text{Sp. gr. B.}}{\text{Sp. gr. A.}}$$

The denser particles would therefore be smaller in each grade than the less dense, a condition most favorable to the separation by sifting and buddling, at the same time diminishing the influence of the unfavorable factors. By carrying the grading to a sufficient extent, so that the finest particle of sand would be no smaller than the largest particle of the denser mineral, we would attain the condition necessary to a clean separation of the sulphurets in one operation. To effect this, however, in the case of pyrite and quartz—or any minerals having the same difference in density—when crushed through screens of, say 24 meshes to the linear inch, would necessitate a division into at least 10 grades. Each of these grades would of necessity require a separate pan, to do the work continuously and with the least expenditure of labor. As ten 10 pans, used in the ordinary way, work the sand from 20 stamps, such a preliminary grading would have to be done on a corresponding scale to avoid the objection of first cost and running expenses, etc., on a proportionately greater number of machines than at present. It is being assumed at the same time that the cost of the grading is amply compensated by the better results to be obtained thereby.

It is not to be supposed, however, that each grain of sand will be obtained in just the proportion required to equally supply each Hendy pan, nor in the proportion of the capacity of each one to work up that particular grade. This will appear from the following table, showing the proportion of sizes in a battery pulp from one of our largest California quartz mills, the Keystone, Amador City:

30 meshes to the linear inch.....	11.5%
40 meshes to the linear inch.....	7.75%
50 meshes to the linear inch.....	14.5%
60 meshes to the linear inch.....	11.5%
70 meshes to the linear inch.....	11.5%
80 meshes to the linear inch.....	5.25%
90 meshes to the linear inch.....	4.75%
100 meshes to the linear inch.....	2.75%
100 mesh siftings.....	30.0%
Total.....	99.50%

The proportionate amount of sulphurets was determined in each size, and was found to increase with the fineness of the size, the siftings from the 100-mesh sieve containing as much as the aggregate percentage of equal volumes of the other sizes.

This proportion of sizes would, of course, be changed by grading, influenced principally by the nature and quantity of the denser mineral, several of the finer sizes of which would go with each coarse size of sand; for instance, in the grade where coarsest particles of sand remain on a sieve of 30 meshes to the linear inch, we should find no sulphurets remaining on a 60-mesh sieve, if we conform to the conditions of grading, giving a ratio of diameter as 1 to 2.5. The quantity of sulphurets present in the above ore being small—in few cases of gold quartz ores worked in California exceeding 5%—it may be assumed that the result of grading would approximate to that of sizing above given, proportioned to conform to the requirements of graded sand.

To arrive at this proportion we must know the absolute size of the holes for each number of sieve, because this size is by no means proportional to the number of meshes, the size of the wire used growing finer with the increase of meshes.

The following table is calculated from a measurement of the wires accurate to 1-100 of a millimeter:

Brass Cloth.	Thickness of Wire.	Aggregate Thickness of Wire.	Hole.
20 meshes.	0.35 mm.	7.00 mm.	0.50 mm.
30 meshes.	0.30 mm.	9.00 mm.	0.53 mm.
40 meshes.	0.23 mm.	9.00 mm.	0.40 mm.
50 meshes.	0.18 mm.	9.00 mm.	0.39 mm.
60 meshes.	0.18 mm.	10.80 mm.	0.24 mm.
70 meshes.	0.14 mm.	10.08 mm.	0.21 mm.
80 meshes.	0.12 mm.	9.60 mm.	0.19 mm.
100 meshes.	0.086 mm.	8.60 mm.	0.164 mm.

We see from this that the sizes obtained from sieves, ranging between 18 and 100 meshes to the linear inch, include just two grades answering to the proportion of diameters 1 to 2.5. The first grade would include the screenings of No. 18 and the leavings of No. 40; while the screenings of No. 40 screened on a No. 100 would leave on the latter the second grade. From the pulp mentioned, we would thus obtain in all three grades, weighing 20%, 50% and 30%. On account of the mechanical defects of grading, the simple scale cannot be relied on to give a product answering to the requirements of theory, and to cover these defects the double scale is generally used, even in the separation of galena and quartz. Applying this here, our scale of double grades would correspond to the sizes 0.16 to 0.25 to 0.40 to 0.64 to 0.100 mm. in a retrograde view, and the corresponding percentages of pulp sand are  $\frac{30}{x}$  24, 26, 13, 7.

The coarser grades, which can be worked off most rapidly, would be obtained in the least quantity, as here shown.

### Objections to Grading.

We can expect, then, that some of the pans would be overfed, while the feed of others would not be equal to their working capacity. True, graders can be constructed adjustable, so as to give in each any proportion of deposit de-

sired; these are undoubtedly preferable, though somewhat more complicated than others, but by such adjustment we fail to fulfill the requirements of a specific proportion in the size of the particles. To keep this discrepancy within proper bounds, we must still further increase the number of grades.

There are also other obstacles in the way of grading in common the pulp from 20 stamps, which will be apparent to those acquainted with the practical details of amalgamating operations, as in use in California gold quartz mills. These make a constant volume and composition of the battery pulp practically impossible, without arrangements again objectionable for other reasons. Consequently the requirements of a sufficient grading for the Hendy pans cannot here be fulfilled, because in the working of most ores, the requirements of amalgamation must take precedence to those of concentration.

Another objection to grading is the amount of fall required by most graders, such being rarely at disposal in existing mills. In view of this the attempt has been made to construct a grader, self discharging and continuous in action, within a fall of 20 inches between battery discharge and inlet of Hendy's pans. To be more independent of the influence of irregularities caused by the amalgamation in the batteries and on copper plates, and to suit the requirements of small mills, the grader was gauged to take the pulp from only five to ten stamps. The coarsest sand being separated by a trap and returned to the battery for finer pulverization, the rest of the pulp was separated into four grades, and each of these worked continuously in a pan by itself.

The resulting concentrates still contained about two-thirds sand, being somewhat richer than those obtained without grading. The concentrates from the three coarser grades, sifted on wire cloth with 100 meshes to the linear inch, left on the sieve 60, 36 and 16%, respectively, containing in these leavings 1-5 to 1-20 sulphurets; the siftings contained in no case much more than one-third sulphurets.

This would indicate that a certain, nearly constant proportion of fine sand separates with the sulphurets and will not separate from them so long as the feeding of pulp is continued, because the larger particles in the latter prevent the fine sand from reaching the surface where it can come under the influence of the buddling action of the water flowing to the central discharge. By interrupting the current of pulp, and feeding for sometime only water, the separation would probably become perfect, at least near the bottom, but it is naturally found more advantageous to perform this operation in a separate pan, placed below the others, so as to take the first concentrates from a sufficient number to fully utilize its working capacity. In this way the working of all the pans can go on uninterruptedly and in a manner requiring the least supervision.

It is very doubtful even, that this separation of fine sand with the first concentrates, would be sufficiently prevented by a system of grading as extensive as above intimated, because some fine sand will always accompany even the coarsest grades, no matter what construction of grader is used. The friction of the water along the sides, eddies, etc., unavoidably produced in any apparatus, prevent the realization of a grading theoretically perfect. The coarser grade from the grader used as above mentioned, although subjected to a strong upward current of clearing water during its separation was found to leave on a sieve of 100, 70, 40, 30 meshes to linear inch, 98%, 96%, 71%, 64% of grade.

The ore yields about 1-5% of "clean sulphurets" by the concentrating operations on about 2,600 tons per month. A number of carefully-made panning tests of the pulp gave an average of about 2% sulphurets in the ore. Even the small quantity of finest sand, 4%, found in the grade mentioned, if it sifts down with these 2% sulphurets found, would result in a first concentrate, not more than one-third sulphurets, such as was actually obtained from the same.

With such evidence that grading will not dispense with the necessity of a second concentration of the concentrates from the first pans, no advantage can be claimed for its use, unless it can be proven that it is otherwise beneficial, in effecting a greater saving of sulphurets than that attained by working the mixed pulp.

This question can only be settled by thorough comparative tests on a large scale, on the same ore and under other like conditions. There does not seem to be much encouragement to make such a comparative trial, where, as in this State, the ore to be treated contains only a low percentage of the mineral to be separated, and this is itself not very valuable. Under proper treatment with the Hendy pans, the loss on that part of the sulphurets contained in the pulp, which would be practically susceptible of extraction by mechanical means, was found to be only 12% at the first pans, and only 22% in the whole work; this is exclusive of that lost by float, which, however, cannot be utilized with any apparatus. Of the 22% here mentioned, a considerable part is caught in some mills by reworking the wastes in sluices, the product consisting principally of coarse sulphurets, lost from the Hendys in the manner above explained.

### Probabilities of Improvement.

In this point it is probable that an improvement could be made by separating these coarse sulphurets from the pulp before it goes into the first pans, giving to these only sands that will pass through a sieve of 36 to 40 meshes to the inch. The coarse material could be worked at



little expense, and very effectively, in a fine sand jigger. Possibly a further saving would be effected by running the waste pulp from all the pans into a funnel tank, discharging the coarse deposit from the bottom, while the finest slum is run over into another funnel tank of larger dimensions, discharging the fine sediment into some separating machine suitable for such work. Of such I may mention Rittinger percussion tables, revolving continuous buddles, and Frue's vanning belt.

It has been accepted as an axiom almost in rational concentration, that sizing or grading of the material is absolutely necessary to effect a good separation with any concentrating machine. To this rule the Hendy pan, in its newest construction, presents a notable exception. I do not hesitate to assert that sizing will not improve the separation in the Hendy, and that grading will only do so to such a limited extent as to make it practically valueless; and that any gain to be derived from a more perfect separation by the use of grading is canceled by the complications and other disadvantages attending the use of the additional apparatus necessary.

Introducing the treatment for the coarse stuff suggested, and, perhaps, also that of the finest in the case of rich sulphurets, I will say that of all the concentrating machines at present in successful practical use for wet concentration, either in Europe or America, none will effect the concentration of medium grade sands, under the peculiar conditions presented in our amalgamating stamp mills, with equal ultimate economy, as the Hendy in its present form, when properly used; and none of them can compete with it in the effectual working of un-sized and ungraded sand, where systematic concentration, by reason of the nature of the ore, cannot be made the leading consideration in the treatment.

In view of the simplification of work thus attained, by dispensing with grading, etc., and the advantages in the arrangement of machinery, it appears but an act of justice to the inventor, and a benefit to those interested in the development of our mineral resources, as well as information of importance to the student of the art of concentration, to thus publish the assertions here made, thus inviting discussion and criticism from those whose practical experience will enable them to contradict or correct.

### New Incorporations.

The following companies have filed certificates of incorporation in the County Clerk's office, at San Francisco: GENERAL CONYER M. Co.—Oct. 20th. Location: Enreka county, Nev. Capital stock, \$5,000,000. Directors—P. E. Conner, C. F. MacDermot, G. W. Blake, C. M. Levy and C. Schomaker.

TRAVELERS M. Co.—Oct. 20th. Location: Los Angeles county. Capital stock, \$100,000. Directors—G. W. Hopkins, Geo. C. Pratt, W. B. Rathbone, Chas. H. Fish and A. W. Havens.

CHIEFTAIN G. and S. M. Co.—Oct. 24th. Location: Inyo county, California. Directors—R. D. Coldren, H. Bartling, H. N. Clement, Chas. Moore and C. J. Platt. Capital \$10,000,000.

THE SEVENTY-SIX S. M. Co.—Oct. 24th. Location: Arizona. Directors—Fred W. Hadley, Clinton Gurnee, John C. Hall, L. Vassar and D. L. Thomas. Capital, \$1,000,000.

HOPE CON. M. and M. Co.—October 24. Location, Storey Co., Nev. Capital stock, \$2,000,000, in 200,000 shares of \$10 each. Directors—John Drenier, George Klein, G. Bacciga, John Miller, Louis Wilkie, Anton Ewald and John Sprecht.

COLUMBIA PETROLEUM Co.—October 24. Location, Cal. Capital stock, \$800,000, in 60,000 shares of \$10 each. Directors—O. H. Brooks, George S. Fife, E. A. Gupit, Joseph J. Stiner, Jacob Schreiber, J. D. Swift and William Andrews, Jr.

PASADENA M. Co.—October 24. Location, State of Nev. Capital stock, \$10,000,000. Directors—R. Weber, W. B. Crane, Thos. Cole, J. C. Riley and C. W. Crane.

EXCELSIOR COAL Co.—October 24. Capital stock, \$100,000. Directors—William L. Higgins, John H. Boalt, Henry K. Moore, Frank J. French and Fred. D. Brandout.

THISTLE M. Co.—October 24. Location, State of Nevada. Capital stock, \$10,000,000. Directors—S. P. Middleton, W. S. Duval, A. C. McCracken, T. J. L. Smiley and G. A. Kne.

BITTER CREEK HYDRAULIC M. Co. Oct. 25th. Location: California. Capital stock, \$480,000. Directors—Frank Shepard, R. L. Taylor, H. E. Bothen, J. J. Scoville and Jerome Waite.

MAYFLOWER GRAVEL M. Co.—Oct. 25th. Location: Placer county, Cal. Capital stock, \$1,200,000. Directors—W. N. Graham, T. Chappell, J. C. H. de Tevel, T. F. Leuterwasser and C. L. Des Roches.

ELKO M. Co.—Oct. 25. Location: Elko county, Nev. Capital stock, \$10,000,000. Directors—T. P. Boyer, A. D. Allen, N. B. Hall, C. C. Burton and L. S. Hall.

### September Bullion Product.

Following is an official statement of the bullion product for the fiscal month of September, of the leading mines in California, Nevada, Utah and Arizona:

Alps	\$14,300
Black Bear	17,000
California	1,535,000
Chollar-Potosi	22,300
Comanche	20,300
Con. Virginia	1,342,300
Empire (Grass Valley)	11,100
Empire (Howland Flat)	21,700
Endowment	13,700
Genova Consolidated	431,200
Genova Consolidated	7,100
Grand Prize	58,300
Indian Queen	5,200
Idaho (Grass Valley)	38,000
Justice	221,000
K. K. Consolidated	45,000
Lead	21,100
Leopard	13,400
Martin White	35,000
McCracken Consolidated	22,400
Manhattan	111,500
Minuetta Belle	18,000
Modoc Consolidated	28,200
Northern Belle	121,200
Ontario	173,500
Raymond & Ely	24,900
Rye Patch	20,400
Standard	153,700
Tyho Consolidated	23,200
Total	\$4,578,000

## PATENTS AND INVENTIONS.

### List of U. S. Patents Issued to Pacific Coast Inventors.

[FROM OFFICIAL REPORTS FOR THE MINING AND SCIENTIFIC PRESS, DEWEY & CO., PUBLISHERS AND U. S. AND FOREIGN PATENT AGENTS.]

By Special Dispatch from Washington, D. C.

WEEK ENDING OCTOBER 10TH, 1874.

WINDMILL.—A. M. Abbott, Stockton, Cal.  
AXLE GAUGE.—W. C. Carlton, Boise City, Idaho.  
WASHING MACHINE.—Aron M. Coriellus, Oregon City, Oregon.

CANDLESTICK.—J. Felling, Unimilla, Oregon.  
BALING PRESS.—Milton S. Laird, San Luis Obispo, Cal.

DRAWING PEN.—Bethune Perry, Alhambra, Cal.  
CHEESE PRESS.—W. H. Atkins, San Luis Obispo, Cal.  
DEVICE FOR RELEASING ANIMALS FROM STALLS.—Daniel R. Martin, S. F.

RIGHTING SCREW.—Michael L. Mery, Chico, Cal.  
PROCESS FOR REDUCING SILVER ORES.—Carl A. Stedfeldt, S. F.

FEEDER FOR STAMP MILL.—Charles C. Stevenson, Gold Hill, Nev.

ELASTIC TRUSS.—G. A. Tyer and W. J. Horne, S. F. TRADEMARK.

YEAST POWDER.—Henry E. Bothin, S. F.

The patents are not ready for delivery by the Patent Office until some 14 days after the date of issue.  
NOTE.—Copies of U. S. and Foreign Patents furnished by DEWEY & CO., in the shortest time possible (by telegraph or otherwise) at the lowest rates. All patent business for Pacific coast inventors transacted with perfect security and in the shortest possible time.

### Notices of Recent Patents.

Among the patents recently obtained through Dewey & Co.'s SCIENTIFIC PRESS American and Foreign Patent Agency, the following are worthy of mention:

BORING AND EXCAVATING APPARATUS.—James Manning and Jerome Haas, Stockton. This is an improved method and apparatus for boring wells, excavating and dredging. A cylinder with its lower end open is taken and the edge sharpened. A little above the bottom the cylinder is divided by a diaphragm, in which is an upward lifting valve. A short distance above the diaphragm is a solid diaphragm, and in the upper part of the cylinder above this diaphragm is a weight or hammer which has a length of stroke in the upper part of the cylinder, so that it can be raised and allowed to drop on the diaphragm for working it into the earth. The hammer is guided in the upper part of the cylinder, and stops prevent it from coming entirely out of the cylinder when hoisted. In operation this apparatus is suspended by a rope from the end of a derrick or hoisting apparatus, the rope being attached to the weight. The sharpened lower edge of the cylinder is then allowed to rest on the ground, and the hammer raised and dropped suddenly, and thus by a succession of blows drive the open ended cylinder into the earth. The valve allows the air and water to pass above the diaphragm as the cylinder is driven into the earth, so that when the lower or earth chamber has been filled, the entire cylinder can be hoisted out and emptied, the water above the valve serving as a packing to keep the valve tight and the consequent vacuum above the earth formed by the weight of material in the cylinder, serving to retain the load. If the hole does not contain enough water, it is supplied from the surface, for which purpose a hole is made in the diaphragm, so that when water is poured in it will pass down and rest on the valve. When the cylinder is filled the hammer is hoisted to the stops, and a further hauling on the rope hoists out the entire cylinder and load.

LINING FOR DITCHES AND FLUMES.—J. P. Culver, S. F. This is a method of constructing flumes to carry water for various purposes, and a means of lining irrigation and other ditches, so as to keep them water-tight and preserve them from the attacks of burrowing, water or other animals. It consists in the employment of burlaps or other fibrous material, which are treated with asphaltum or other carbonaceous substance, with or without a curving or backing of thin wood or veneer. The object is to prevent the loss of water by working into the banks or otherwise, to prevent the ravages of burrowing animals which might rupture or destroy the banks or ditches, and also to protect the earth of the banks from being washed by rapid currents, so as in effect to allow the passage of a greater quantity of water without injury to the earth-work.

A RAILROAD smash-up occurred on Monday morning last, on the California Pacific road near Elmira station. A culvert had been hurried during the preceding night, and, as the early train came rushing along the rails were still in place, but their supports had burned away. The locomotive jumped the chasm safely, but the tender, baggage, smoking and first passenger cars plunged in. Fortunately only one man was injured and that not very seriously. Mr. Hopkins, of Dixon, was the unfortunate, or rather we might say the fortunate man, who ran such a risk and escaped with merely a slight scalp wound.

BRIGHT things can never die, and neither can Morse's memory, for the millions of loved ones he has transferred to cardboard for the people, will be an everlasting monument to him and his art. See his specimens at No. 417 Montgomery street.

### General News Items.

A NEW gas franchise for this city has been petitioned for before the Board of Supervisors. An order has been made for consideration, in which it is required that a certain amount of work must be done within a given time, and gas furnished to consumers at \$2.50 per thousand.

TURKEY is putting out a new loan. If there is anything the Turk delights in, it is in borrowing money of the Christian dogs, and paying them when he is able. And although he is never able, he, nevertheless, gets the money all the same of Johnny Bull, who still desires to keep the Turk between himself and his Russian neighbor.

FRESH WATER FOR VESSELS.—Several ship owners not liking the present monopoly and high price of water for shipping along the city front, have made arrangements for the little steamer *Hiawatha* to supply water to the ships in the harbor. The water will be obtained in Marin county, and is said to be very clear, sweet and fresh.

A FATAL EMBUE.—The prisoners in the shoe shop of the State prison at Carson, Nevada, made a strike for liberty a few days since, carrying their keeper before them to ward off the bullets of the guard. The plucky keeper commanded the guard to fire and not mind him. The command was thrice repeated before the guards were willing to obey, but when they did it told with fatal effect on the ringleader, and a severe flesh wound through the arm of the keeper. The prisoners thereupon gave in.

### Thanksgiving Proclamation by the President.

WASHINGTON, October 29th.—The following was issued this afternoon:

By the President of the United States of America.—Proclamation.

The completed circle of summer and winter, seed-time and harvest, has brought us to the accustomed season at which we as a religious people celebrate, with praise and thanksgiving, the enduring mercy of Almighty God. This devout and public confession of the constant dependence of man upon the Divine Father for all good gifts of life and health, of peace and happiness, so early in our history made the habit of our people, finds in the survey of the past year new grounds for its joyful and grateful manifestation. In all the blessings which depend upon benign seasons, this has indeed been a memorable year. Over the wide territory of our country, with all its diversity of soil and climate and products, the earth has yielded a bountiful return to the husbandman. The health of the people has been blessed by no prevalent or wide-spread disorders; no great disasters of shipwreck upon our coasts, or to our commerce on the seas, have brought loss or hardships to merchants and mariners, and clouded the happiness of the community with sympathetic sorrow. In all that concerns our strength and peace and greatness as a nation; in all that touches the permanence and security of our Government and the beneficent institutions on which it rests; in all that affects the character and dispositions of our people and tests our capacity to enjoy and uphold the equal and free condition of society—now permanent and universal throughout the land—the experience of the last year is conspicuously marked by the protecting providence of God, and is full of promise and hope for the future. To God, therefore, for a sense of these infinite obligations to the Great Ruler of the universe and events, let us humbly ascribe it to our own faults and frailties, if any degree of that perfect concord and happiness, peace and justice, which such great mercies should diffuse through the hearts and lives of our people, do not altogether and always and everywhere prevail. Let us, with one spirit and one voice, lift up praise and thanksgiving to God for His manifold goodness to our land and His manifest care for our nation.

Now, therefore, I, Rutherford B. Hayes, President of the United States, do appoint Thursday, the 29th day of November next, as a day of National Thanksgiving and Prayer, and I earnestly recommend that, withdrawing themselves from their secular cares and labors, the people of the United States do meet together on that day, in their respective places of worship, to give thanks and praise to Almighty God for His mercies, and to devoutly beseech their continuance.

Position Wanted.—A Mining Engineer, with best California references, well experienced in tunneling and shaft sinking, good will-man, competent assayer and surveyor, desires a position with some mining company, to assist a mining or hydraulic engineer, assayer, etc. Address, M. E. this office.

E. M. DENNY will please address Dewey & Co., San Francisco, immediately, without fail.

### LEATHER.

[WHOLESALE.]

WEDNESDAY M., October 30, 1877.

Sole Leather, heavy, lb.	26 @ 23
Light	22 @ 22
Joblot, 8 Kil.	43 @ 65 00
11 to 13 Kil.	65 @ 76 00
14 to 19 Kil.	80 @ 49 00
Second Choice, 11 to 16 Kil.	55 @ 67 00
Correllan, 12 to 16 Kil.	57 @ 67 00
Female, 12 to 13 Kil.	63 @ 67 00
14 to 16 Kil.	71 @ 76 50
Simon Ulmo, Females, 12 to 13 Kil.	53 @ 62 00
14 to 15 Kil.	58 @ 67 00
16 to 17 Kil.	60 @ 64 00
Simon, 15 Kil.	61 @ 63 00
20 Kil.	65 @ 67 00
24 Kil.	72 @ 74 00
Robert Calif. 7 and 9 Kil.	35 @ 64 00
Kips, French, lb.	1 00 @ 1 35
Cal. doz.	40 @ 60 00
French Sheep, all colors	8 00 @ 15 00
Elephant Hair, Bocks, lb.	9 00 @ 13 00
Sheep Skins for Topping, all colors, doz.	9 00 @ 13 00
For Linings	5 50 @ 10 50
Cal. Russet Sheep Linings	1 75 @ 4 50
Boat Legs, French Calf, pair	4 00 @ 4 75
Best Jodot Calif.	5 00 @ 5 25
Leather, Harness, lb.	35 @ 38
Fair Bridle, doz.	48 @ 72 00
Stirring, B.	33 @ 37
Welt, doz.	30 @ 50 00
Buff, ft.	18 @ 20
Wax Side	17 @ 18

### Gold, Legal Tenders, Exchange, Etc.

[Corrected Weekly by SUTRO & Co.]

SAN FRANCISCO, October 30, 3 P. M.  
LEGAL TENDERS IN S. F., 11 A. M., 97 1/2 @ 98. SILVER, 4 @ 93  
GOLD IN NEW YORK 102 1/2  
GOLD BARS, 900. SILVER BARS, 8 @ 15 1/2 cent. disc. count.

EXCHANGE ON NEW YORK, 1/2% on London bankers, 49 1/2; Commercial, 46 1/2; Paris, five francs @ 1 dollar; Mexican dollars, 96.  
LONDON CONSOLS, 95 3/16; Bonds, 106 1/2.  
QUICKSILVER IN S. F., by the flask, 1 lb, 46 @ 47 1/2.

### METALS.

[WHOLESALE.]

THURSDAY, M., October 31, 1877.

IRON—	
American Pig, ton.	28 00 @ 32 00
Scotch Pig, ton.	32 00 @ 33 00
White Pig, ton.	28 00 @ —
Oregon Pig, ton.	— @ —
Refined Bar.	31 @ 61
Horse Shoes, keg.	5 00 @ —
Nail Rod.	— @ 7 1/2
Norway, Oval.	— @ 7 1/2
Roller.	— @ —
COPPER—	
Copper Tinned.	37 @ 40
Sheathing, lb.	37 @ 40
Sheathing, Yellow.	21 @ 22 1/2
Sheathing, Old Yellow.	10 @ 11
Composition Nails.	21 @ —
Composition Bolts.	24 @ —
STEEL—	
English Cast, lb.	14 @ 5
Anderson & Woods, ordinary steel.	16 @ —
Drill.	16 @ —
Flat Bar.	15 @ 18
Pow Steel.	8 @ 12 1/2
10x14 C. Charcoal.	5 50 @ 9 00
Banca Tin.	24 @ —
Australian.	19 @ 30
ZINC—	
By the Cask.	11 @ —
Zinc Sheet 7x3 ft. 7 to 10, lb.	11 @ —
7x3 ft. 11 to 14.	11 @ —
8x4 ft. 8 to 10.	12 @ —
8x4 ft. 11 to 10.	12 @ —
NAILS—	
Assorted sizes.	3 00 @ 3 25
QUICKSILVER—	
By the lb.	47 1/2 @ 50

### Signal Service Meteorological Report.

Week Ending October 30, 1877.

HIGHEST AND LOWEST BAROMETER.									
Oct. 24	Oct. 25	Oct. 26	Oct. 27	Oct. 28	Oct. 29	Oct. 30	Oct. 31	Oct. 30	Oct. 31
30.17	30.12	30.10	30.12	30.08	30.05	30.08	30.11	30.07	30.09
30.11	30.07	29.99	30.04	30.01	30.00	30.00	30.11	30.07	30.09
MINIMUM AND MAXIMUM THERMOMETER.									
65	57	63	61	61	62	62	58	57	64
58	55	54	53	51	52	54	58	55	62
MEAN DAILY HUMIDITY.									
82	91	63	57	38	20	51	82	91	63
PREVAILING WIND.									
W	W	NW	NW	N	N	NW	W	W	NW
132	206	182	206	322	632	308	132	206	182
WIND—MILES TRAVELED.									
Clear.	Rainy.	Clear.	Clear.	Clear.	Clear.	Clear.	Clear.	Rainy.	Clear.
RAINFALL IN TWENTY-FOUR HOURS.									
.02							.02		
Total rain during the season, from July 1, 1877. 0.67 in.									

## Mining and Other Companies.

Persons interested in incorporated shares will do well to recommend the publication of the official notices of their companies in this paper, as the cheapest appropriate medium for the same.

### California and Oregon Land Company.

Location of principal place of business, San Francisco, California. Location of works, Jackson County, Oregon. Notice is hereby given, that at a meeting of the Board of Directors, held on the seventeenth day of October, 1877, an assessment No. 1, of thirty-five cents per share was levied upon the capital stock of the company, payable immediately in U. S. gold coin, to the Secretary, at the office of the company, 418 California Street, San Francisco, California.

Any stock upon which this assessment shall remain unpaid on the twenty-eighth day of November, 1877, will be delinquent, and advertised for sale at public auction, and unless payment is made before will be sold on Monday, the twenty-fourth day of December, 1877, to pay the delinquent assessment, together with costs of advertising and expenses of sale. By order of the Board of Directors.

J. W. CLARK, Secretary.  
Office, 418 California Street, San Francisco, California.

### Fresno Quicksilver Mining Company.

Location of principal place of business, San Francisco, Cal. Location of works, Mexico, Fresno county, Cal.

Notice.—There is delinquent upon the following described stock, on account of assessment No. 5, levied on the nineteenth day of September, 1877, the several amounts set opposite the names of the respective shareholders, as follows:

Names	No. Certificate.	No. Shares.	Amount.
Brown, W. E.	280	7000	\$140 00
Brown, W. E.	307	7000	140 00
Friedberg, Chas.	51	300	6 00
Friedberg, Chas.	217	100	2 00
Friedberg, Chas.	309	400	8 00
Haley, John J., trustee.	37	1000	20 00
Haley, John J., trustee.	83	1000	20 00
Haley, John J., trustee.	00	680	13 60
Haley, John J., trustee.	285	4320	86 40
Haley, John J., trustee.	327	7000	140 00
Robinson, E. J.	200	500	10 00
Robinson, E. J.	201	500	10 00
Robinson, E. J.	320	1000	20 00
Robinson, E. J.	329	655	13 10
Robinson, Clara M.	204	25	5 00
Robinson, Clara M.	322	25	5 00

And in accordance with law, and an order of the Board of Directors, made on the nineteenth day of September, 1877, so many shares of each parcel of such stock as may be necessary, will be sold at public auction, at the office of the company, 414 California Street, San Francisco, California, on Tuesday, the thirteenth day of November, 1877, at the hour of one o'clock P. M., of said day, to pay said delinquent assessment thereon, together with costs of advertising and expenses of sale. R. WEGENER, Sec'y.  
Office, 414 California Street, San Francisco, Cal.

### Merced Mining and Water Company.

Principal place of business, San Francisco, Cal. Location of works, Mariposa Co., Cal.

Notice is hereby given that at a meeting of the Board of Directors, held on the second day of October, 1877, an assessment (No. 1) of fifty (50) cents per share was levied upon the capital stock of the corporation, payable immediately in U. S. gold coin, to the Secretary, at the office of the company



## Iron and Machine Works.

**PACIFIC ROLLING MILL CO.,**  
SAN FRANCISCO, CAL.

Established for the Manufacture of  
RAILROAD AND OTHER IRON

Every Variety of Shafting,  
Embracing ALL SIZES of  
Steamboat Shafts, Cranks, Piston and Con-  
necting Rods, Car and Locomotive  
Axes and Frames,

Hammered Iron of Every Description and Size  
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COMPANY, P. O. Box 2032, San Francisco, Cal., will re-  
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The highest price paid for Scrap Iron.

THOS. PENDERGAST.

HENRY S. SMITH

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**IRON CASTINGS**

and **MACHINERY**

OF ALL KINDS.

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**Risdon Iron and Locomotive Works**

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Are prepared to make SHEET IRON AND ASPHALTUM  
PIPE, of any size and for any pressure, and contract to  
lay the same where wanted, guaranteeing a perfect work-  
ing pipe with the least amount of material.

Standard sizes of Railroad Car Wheels, with special pat-  
terns for Mining Cars. These small wheels are made of  
the best Car Wheel Iron, properly chilled, and can be  
fitted up with the improved axle and box—introduced by  
this company, and guaranteed to outlast any other wheels  
made in this State.

All kinds of Machinery made and repaired.

JOSEPH MOORE, Superintendent.

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MANUFACTURING COMPANY.**

Manufacturers of all kinds of

Wharf and Bridge Bolts, Railroad Trestle  
Work, Car Frames and Bolts, Machine  
Bolts, Set Screws and Tap Bolts,  
Lag or Coach Screws.

ALL STYLES OF FANCY HEAD BOLTS.  
HOT AND COLD PRESSED HEXAGONAL AND  
SQUARE NUTS, WASHERS, BOLT ENDS,  
TURNBUCKLES, ETC., ETC.

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SAN FRANCISCO, CAL.

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PRACTICAL BOILER MAKERS,

Marine, Stationary and Portable Boilers, Smoke Stacks,  
Hydraulic Pipe, Oil or Water Tanks, Ore and  
Water Buckets, Gasometers, Girders, Bridges  
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ALL KINDS OF SHEET IRON WORK.  
Repairing promptly attended to at the  
lowest possible terms.

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Manufacture Iron Castings and Machinery  
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Mold-Board AMALGAMATORS,

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All kinds of Brass, Composition, Zinc, and Babbitt  
Metal Castings, Brass Ship Work of all kinds, Spikes,  
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plings and Connections of all sizes and patterns, furnished  
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RETORTS AND CONDENSERS, ROASTING AND CHLORIDIZING FURNACES,  
SUGAR MILL MACHINERY, WATER WHEELS, Etc., ALL OF THE  
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The Only Illuminating Tile Manufactured for Light-  
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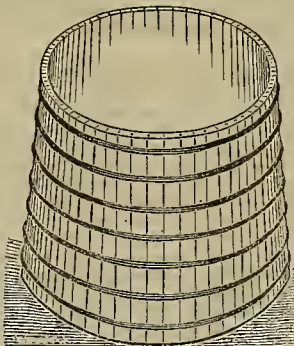
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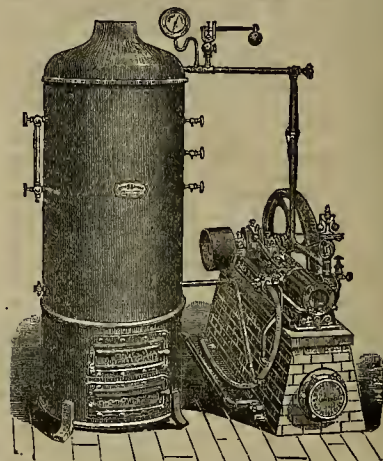
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Guaranteed to Chloridize from 85 to 95 per cent. of any  
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shape for working in cupola furnaces.

Cost of Roasting and Chloridizing 20 Tons  
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One man.....	\$ 4 00
One man.....	3 00
Wood—23 Cords at \$3 per cord.....	5 25
Salt—1,600 lbs at 2 1/2 cents.....	40 00

Cost of 20 tons.....\$52 25  
Cost of one ton.....2 61 1/2

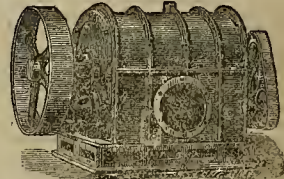
In a furnace of three or four times this capacity the  
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The furnace is now working successfully at the Poe Con-  
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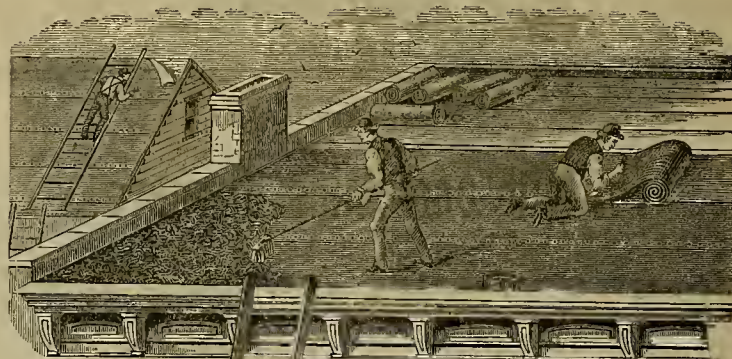
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Asbestos Roof Paints for Leaky Roofs,

ASBESTOS BOILER AND PIPE COVERINGS



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COMBINATION  
—OF—  
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RAWHIDE  
LEATHER  
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OSCEOLA MINE, NEVADA CO., CAL., April 19th, 1877.  
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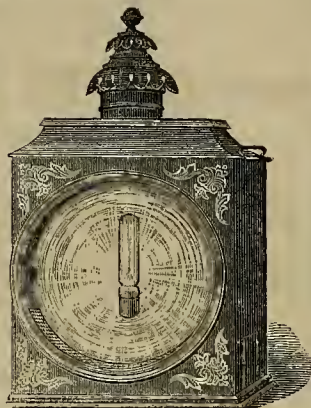
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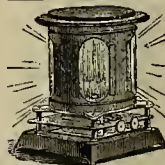
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# MINING AND SCIENTIFIC PRESS.

An Illustrated Journal of Mining, Popular Science and General News.

BY DEWEY & CO.,  
Patent Solicitors.

SAN FRANCISCO, SATURDAY, NOVEMBER 10, 1877.

VOLUME XXXV.  
Number 10.

## Items of Interest from the Mines.

We give below items of interest from prominent mines, most of which are collated from letters of the respective Superintendents on file at the offices in this city:

The circulation of air in the Hale & Norcross mine is now excellent.

The Chollar-Norcross-Savage shaft is now 1,744 feet deep.

The crosscut on Savage north line has been discontinued on account of water.

Work has been resumed on the Mexican and Ophir joint winze.

The dump on the incline station, 1700-foot level of the Ophir, to receive California ore, has been completed.

The average assays of the ore in the 230-foot level of the Crown Point, are from \$20 to \$40 per ton.

The volume of water from the face of the tunnel of the South Barcelona continues as large as ever.

The Manhattan letter of the 2d says: From the 26th of October to the 31st the mill reduced 106 tons, the assay value of which is \$16,965.34. Of this amount, \$1,338.16 was from custom ores, and the remainder \$15,627.18, from the Frost and Curtis shafts. The mill has reduced for the month of October 682½ tons, the assay value of which is \$131,101.92, of which amount \$14,720.30 comes from custom or purchased ores. At the Curtis shaft sinking has been resumed on the Curtis winze, with very little water to interfere. The ledge is large, but carries very little pay ore.

In the Eureka Con. mine the winze on the 10th level has been sunk a distance of 31 feet, and still remaining in ore. The ore body on this level is looking first rate and continues to improve in size, etc., as developments are advanced. There has been extracted during the week some 1,600 tons of ore, one-half of which was taken from the 10th level. There has been delivered at the furnace 1,411 tons of ore, which produced 310½ tons of bullion.

Crosscutting was commenced last week on the 248-foot level of the Bodie.

In order to be sure and not flood the 1900-foot level, the Superintendent of the Gould & Curry will drill west to a point where the main incline will strike the level, and if no water is encountered, they will follow up the drill hole and commence an upraise to meet the main incline.

## Academy of Sciences.

The regular meeting of the California Academy of Sciences was held on Monday evening last, Prof. Davidson in the chair. Among numerous contributions, Dr. Kellogg presented acorns, leaves, etc., of a new species of oak which has lately been discovered in Lower California, by a gentleman named Dunn, and called after him, *Ivercus Dunnii*. Dr. Kellogg described the newly found plant at length. Dr. Stout, while complimenting the zeal and culture which leads to the discovery of new matter, or rather the new discovery of matter, objected strongly to the fashion which has so long obtained of naming astronomical or natural objects after the person who first points them out to the world, and found fault, in fact, with all personal scientific nomenclature.

Dr. Saxe, although agreeing to a certain extent with the previous speaker, thought that to the discoverer belongs the spoils, at least so far as recognition of his name is concerned.

Prof. Davidson read an interesting paper on improvements in geodetic instruments. He also read a short paper on the rotation of Saturn.

Dr. A. M. Saxe, of Santa Clara, presented a new species of climbing vine, which Dr. Kellogg described as the *Luffa spongiosa*, or vegetable sponge; the inner portion of the gourd fruit consisting of a dense mass of tough, interlaced network of fibers, used as a sponge.

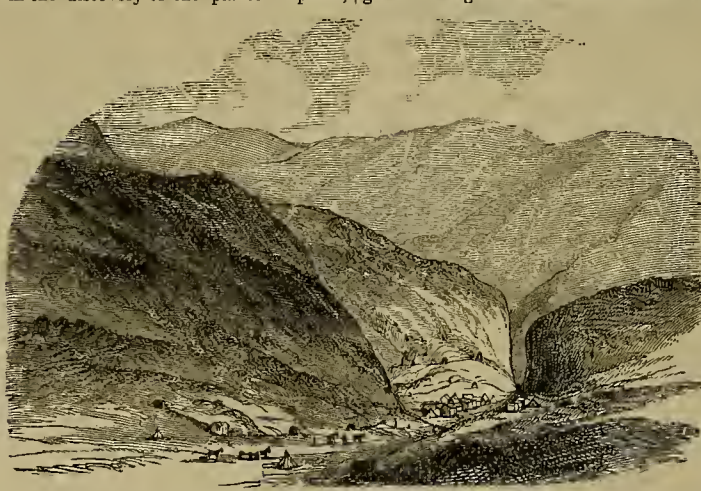
Dr. Kellogg proposed an amendment to the Constitution, which would permit the admission of women to membership. The amendment was considered unnecessary, as, in the opinion of all present, equal privileges are already extended by the Constitution to persons of both sexes.

## On the Death of Leverrier.

At the meeting of the Academy of Sciences, on Monday evening last, Prof. Geo. Davidson, made the following remarks on the death of Leverrier, the eminent astronomer: "On the 23d of September there passed away the life of one of the greatest of modern astronomers; and by a curious coincidence, upon the thirty-first anniversary of the discovery of the planet Neptune. The marvelous extent and great utility of Leverrier's labors throughout a long series of years can only be fairly estimated by an exhaustive resume of his investigations. There is, possibly, not a dozen persons who can thoroughly appreciate the breadth and depth of his researches and their eminently practical application in modern mathematical astronomy. Last year the Royal Astronomical Society, under the Presidency of Prof. Adams, presented to Leverrier a second gold medal, a reward which is regarded as the highest tribute that that learned society can offer of their appreciation of his work. In 1868, 1848 and 1846 he had also received medals and testimonials from the Royal Society and the Royal Astronomical Society, and, in 1875, the University of Cambridge, at the suggestion of Prof. Adams, his so-called rival in the discovery of the planet Neptune,

## The "Devil's Gate."

The term "gate" has on this coast frequently been applied to mountain defiles or narrow gorges having precipitous sides. Thus the entrance to the Bay of San Francisco has been named the Golden Gate. There being, on the old overland stage route, in the State of Nevada, two passages of this kind called, because of their relative positions, the East and the West Gate. The point where the Colorado river flows between two great crags, tinted with many delicate colors, has been aptly called the "Porphyry Gate," these passage ways receiving such qualifying prefixes as their natural features or other peculiarities may suggest. The defile represented by the accompanying cut has been very properly designated the "Devil's Gate," because of its rough and scraggy appearance. It forms a part of Gold canyon, and constitutes a point on the boundary line between Lyon and Storey counties in the State of Nevada. Its locality is three miles below the town of Gold Hill, four miles below Virginia City. The view represented in the cut supposes the spectator to be looking up the canyon towards the west, the high ridge dimly seen in the background being the Washoe or Mount Davidson



THE DEVIL'S GATE, WASHOE.

conferred upon him the degree of LL. D. But the most valued recognition that could be offered by English astronomers to his great merit was the adoption by the Nautical Almanac of his tables for the computation of the places of the planets. No man was better fitted than Adams to appreciate the vastness of the more recent works which Leverrier undertook and accomplished in elucidating the theories of the mutual disturbances of the group of larger planets—Mercury, Venus, the earth and Mars. In 1872 the programme of work he proposed for himself was, in the language of Adams, 'appalling,' and, when communicating his statement, upon the presentation of the last gold medal, Adams says: 'That any one man should have had the power and the perseverance required thus to traverse the entire solar system with a firm step, and to determine with the utmost accuracy, the mutual disturbances of all the primary planets which appeared to have any sensible influence on each other's motions, might well have appeared incredible if we had not seen it actually accomplished.' It is hardly possible to avoid the painful conviction that labors such as these have shortened the life of one of the few really great astronomers of the age. The too tensely drawn cord must strand and finally yield; the laws governing health are as immutable as the laws governing the planets. Learned societies throughout the world will mourn their late associate. Those devoted to the object of his special duties lose from their ranks a leader among leaders."

REPRESENTATIVE PAGE has introduced a bill appropriating \$100,000 for the erection of a new Postoffice building at Sacramento.

Range of mountains along the side of which the Comstock lode is situated. The hamlet just below the "Gate" is Silver City, a place that has grown considerably since this view was sketched. The indentation opposite the lower end or the town shows the entrance to American canyon. The hills along Gold canyon rise to a height of 400 or 500 feet, the sides of the "Devil's Gate" being about 200 feet nearly perpendicular, the bottom of the passage being barely wide enough for a wagon road.

**BULLION SHIPMENTS.**—Since our last issue shipments of bullion from the prominent mines have been as follows: Con. Virginia, Oct. 31st, \$188,531.47; California, 31st, \$198,579.10; Modoc, 30th, \$6,984.22; Alps, Nov. 1st, \$1,600; Gold Hill, Idaho, \$11,290; Northern Belle, 3d, \$5,617.21; Gila, 1st, \$10,774; Modoc, 1st, \$8,502.58; Endowment, 3d, \$2,193.08; Arizona, 3d, \$2,323.17; California, 3d, \$236,794.55; Con. Virginia, 3d, \$107,453.05; Northern Belle, 1st, \$5,242.19; Day, Oct. 31st, \$22,038; Modoc, Nov. 3d, \$3,960.39; Grand Prize, 5th, \$22,500; Leopard, 5th, \$3,900; Gila, 4th, \$10,771.98; Northern Belle, 3d, \$5,665.95.

A DECIDED improvement has taken place in winze sinking on west ore spur, 800-foot level of the Justice. Winze sinking on east ore spur presents a favorable appearance. This winze is entirely free from water and situated on 800-foot level.

THE Spanish government is negotiating with bankers for a loan of 30,000,000 pesetas. The army estimates show a reduction of 3,000,000 pesetas.

## Paper Stock and Manufacture.

The difficulty of finding an efficient substitute for rags in the manufacture of paper has long been felt and acknowledged in all parts of the civilized world. Large rewards, we believe, have been offered for the discovery of any new and really practical material. The British government has ransacked all India, and the London Times and New York Herald have spent large sums of money in the search of some suitable material in Africa. Scores of patents have been taken out for the manufacture of paper from straw, hop vines, rushes, esparto grass, and various woody fibers, such as poplar, beech, birch, etc.; but all have proven failures in a greater or less degree, and can be utilized for good paper only by the addition of a large amount of rag or manila stock, which is very expensive.

What is wanted is some vegetable matter, practically inexhaustible, which can be had at a low price and which can be made into a good paper without any or at most with very little admixture of rags. Judge Geo. B. Walker, of this city, seems to have found this desired material in the *Yucca draconis*, better and more popularly known as the giant cactus of the Mohave desert. This plant, though eluded by hotanists as a grass, nevertheless grows to large proportions as a tree, and exists on the desert aforesaid in large forests, extending hundreds of miles from the western extremity of the desert southwardly and eastwardly through San Bernardino county and Arizona into Mexico. The supply is absolutely inexhaustible, even though all the world should come for it. Moreover the tree grows rapidly from the roots of the living tree when the parent stem is cut down. It is now being gathered along the line of the railroad and delivered to the cars for some \$2 or less per cord. The entire body of the tree, except the bark, is worked up into paper, with a loss of not more than 25% or 30%.

The parties now working it are limited in means, but have a pulp mill near the desert, where the wood is reduced to a fiber and shipped to the Lick mills, near Santa Clara, which have been leased, and where the fiber is converted into paper. The manufactured article sells readily in this city at good prices. So far, manila paper only has been manufactured, and is used for wrapping purposes by dry goods dealers and others, and for paper bag manufacture.

We understand that arrangements are nearly perfected for throwing the business into a joint stock company, with large capital, for the erection of mills and procurement of more extensive and superior machinery to that which is now used. Nothing but means is wanted to make this one of the most important and lucrative enterprises on the Pacific coast. We understand the gentlemen having it in hand have both faith and money, and are only waiting the expected arrival from the East of the gentleman who is to make the necessary estimates for the capital and the drawings for the machinery needed. So we may soon hope to see all the paper used on this coast manufactured in our midst.

Experiments have been made which go to show that this tree will produce a much better material for newspaper than the mixed materials which are now being used in the manufacture of paper for the large New York dealers, and probably at a price which will admit of its transportation hence to New York. If such should be the case, there is no fixing the limit to the extent to which this business may be carried.

THE biennial report of the Surveyor General just filed with the Governor, shows that the area of the State of California amounts to 100,500,000 acres. The fees collected by the Surveyor General from December 6th, 1875, to August 1st, 1877, amount to \$16,297.50. The fees of the Register of the State Land Office for the same period amount to \$6,147.75.

THE Central Pacific Railroad Company planted 300,000 trees, chiefly eucalyptus, along the line of their road last season, and they have ordered over 700,000 more, which will be set out the coming season.



## CORRESPONDENCE.

It is the desire of the editors of this journal to be liberal toward all correspondents, and therefore statements and opinions are frequently published, on the authority of the writers, for which we do not assume responsibility.

### Harrisburg District.

EDITORS PRESS:—My attention has just been called to an article in your issue of September 15th, 1877, copied from the *Pioche Record*, under the caption of "Utah," as follows:

"We understand that Louis Janin, President of the Leeds company, intends sending to Silver Reef a diamond drill, for the purpose of prospecting the mines owned by that company. As the ledges there all lie flat, that will be the least expensive way in which to tell what the company have, etc."

Now, inasmuch as the above article is calculated to injure that mining district, and the poor hard-working miners who have spent their last dollar in developing their claims, and are now inviting San Francisco capital to that section to help them out by putting up reduction works, mills, etc., to reduce the ore which they have in sight, I would ask the privilege of correcting the statements in said article through the columns of your valuable paper.

1. The reef above referred to is known as "White Reef," and not "Silver Reef," as stated by Mr. Janin, and it is on this reef that most of the mines are located in the Harrisburg district, including the Leeds.

2. The Leeds company have already an incline shaft over 900 feet deep from the crest of the reef, and in good paying ore all the way, and improving as they go down.

3. None of the strata or ore veins in or on this reef lie flat, but, on the contrary, they all have a uniform pitch of about 40°.

The reasons Mr. Janin had for making the statements accredited to him in said article, which are wholly false, are best known to himself, and the only result which would follow, providing any persons could be found who would believe him, would be to prejudice outsiders against the district, thus enabling him and the unscrupulous bears who are interested with him to "gobble" up everything in that section of the country. Give the miners a chance, and do not allow them to be squeezed out by such operations.

A. H. PARKER,  
Mining Engineer.

San Francisco, Nov. 1st, 1877.

WEIGHT OF ONE CUBIC FOOT OF GOLD.—EDITORS PRESS:—As there has been considerable discussion among the miners around here as to the weight of one cubic foot of gold, we have agreed to have you inform us through your valuable paper.—MINER, Golden Willow Bar, Plumas county.

[One cubic foot of gold weighs 17,502 ounces troy, and is worth, if pure, \$361,808.64. The avoirdupois weight of a cubic foot of gold is 1,200.21 pounds.—EDS. PRESS.]

### The Silver Caves of Peru.

Henry Sewell, in the *London Mining Journal*, thus describes these curious deposits: "The mineral caves of Huallanca are situated at 14,700 feet above the level of the sea. The inspection of these mines was a very trying affair, the rarification of the air causing an extraordinary increase in the pulsation of the heart, and making it dangerous to move about except with great care. These silver mines are situated in the heart of a coal formation which has been upheaved by the outburst of porphyry, forming immense backbones. The stratification is standing on its beam ends, and almost perpendicular. The class is a new tetrahedrite, containing about 800 ounces to the ton, and about 150 yards to the left is the first coal seam from where the smith orders his coal to be extracted. The ores containing 100 to 130 ounces to the ton are thrown over the dumps, their carriage to the coast being too expensive. I recommended the owners to collect these poorer ores and to smelt them in a reverberatory furnace into regulus, thus raising them about 600 ounces to the ton. The ore is found in the shaly portion of the formation as well as in the sandstone. In the latter it is found in a most singular condition—in huge 'vugs' or caves, many of these being as much as 25 to 30 feet long, and about an equal size in depth. These caves are coated with from two inches to three inches of argentiferous ores, and millions of crystals of tetrahedrite are destroyed by the picks of the miners, who break down the ore in that manner. Some of these caves have produced as much as £30,000 in a single day. The way they are discovered by the native miners is also singular. They follow for months a thin little cleavage of about an eighth of an inch. This contains chalcidony, and they drive horizontally and at an incline of 45° in order not to miss them. They vary in size from a few feet to the above."

SOLUTION FOR BRIGHTENING SILVER.—Cream of tartar, 30 parts; sea salt, 30; sulphate of aluminum and potash, 30; water, 1,500. An extremely brilliant color can be given to silver-ware by boiling it in this mixture.

### The Legislature of 1877-8.

In a few weeks the Legislature will assemble at Sacramento. The session of 1877-8 will doubtless find its attention claimed by some of the most important issues which have lately fallen to the lot of people's representatives to determine. Questions will arise which will require the closest study, the widest knowledge, and the most unswerving integrity for their true adjustment. These qualities we trust the new Legislature will give early evidence of possessing, and it will quickly win the people's support and gratitude. As Legislators approach their work they should be sure that they understand the wishes and the best interests of those they represent. We have no doubt that many errors in legislation have been the result of a lack of understanding of what the people really desired, and Legislators have been led into unsuspecting support of private interests which were thrust upon their attention rather than the general good which was obscured. Therefore the people owe a duty to their representatives in the plain expression to them of things their best interests demand. If the people wink at evils which are coming forward to the public detriment, they cannot blame their representative if he does not always detect the wrong. Our columns will be open during the session for the expression of truth concerning legislative topics, which pertain to the industries which we represent. Much information, coming from the people, will be spread out so that the people's representatives may learn the sentiment not only among those whom they immediately represent, but of the workers throughout the State. On the other hand we shall watch the proceedings at Sacramento closely and furnish condensed statements of all matters affecting the public good, and the especial industries we serve. In order that all readers may have early information of the men in whose hands their interests will soon be placed, we print below the complete list of the members of both houses and the political faith to which they are accredited:

#### Senators.

The (\*) asterisk signifies that the Senator is a hold over—all the others are newly elected:

First District—San Diego and San Bernardino—J. W. Satterwhite.  
Second District—Los Angeles—George H. Smith, D.  
Third District—Ventura, Santa Barbara and San Luis Obispo—P. W. Murphy, D.  
Fourth District—Fresno, Tulare, Kern, Mono and Inyo—Thomas Fowler, D.  
Fifth District—Mariposa, Merced and Stanislaus—John M. Montgomery, D.\*  
Sixth District—Monterey, San Benito and Santa Cruz—Thomas Flint, R.  
Seventh District—Santa Clara—W. Z. Anguey, D.\*; D. B. Murphy, D.  
Eighth District—San Francisco and San Mateo—Geo. H. Rogers, D.\*  
Ninth District—San Francisco—T. McCarthy, D.\*; J. C. Murphy, D.  
Tenth District—San Francisco—J. Craig, D.\*; Peter Dean, R.  
Eleventh District—San Francisco—E. Numan, D.\*; J. S. Boyston, D.  
Twelfth District—San Francisco—William M. Pierson, D.\*; M. J. Donovan, D.\*  
Thirteenth District—San Francisco—Frank McCoppin, D.\*; Robert Howe, D.\*  
Fourteenth District—Alameda—James Beazell, D.\*; Nathan Porter, R.  
Fifteenth District—Contra Costa and Marin—Paul Shirley, D.\*  
Sixteenth District—San Joaquin and Amador—George S. Evans, R.\*; Frank M. Brown, R.  
Seventeenth District—Calaveras and Tuolumne—W. M. Gwin, Jr., D.  
Eighteenth District—Sacramento—Creed Haymond, L.\*; N. Greene Curtis, D.  
Nineteenth District—Solano and Yolo—S. G. Hilborn, R.\*; John Lambert, D.  
Twentieth District—Napa, Lake and Sonoma—Wm. McPherson Hill, D.\*  
Twenty-first District—Sonoma—A. P. Whitney, R.  
Twenty-second District—Placer—W. C. Norton, R.  
Twenty-third District—El Dorado and Alpine—Wm. H. Brown, R.  
Twenty-fourth District—Sierra and Nevada—Niles Searles, D.\*; John C. Coleman, D.  
Twenty-fifth District—Yuba and Sutter—Jesse O. Goodwin, R.  
Twenty-sixth District—Butte, Plumas and Lassen—W. H. Crane, R.  
Twenty-seventh District—Del Norte, Humboldt and Mendocino—R. McGarvey, D.\*  
Twenty-eighth District—Siskiyou, Modoc, Trinity and Shasta—Daniel Ream, D.  
Twenty-ninth District—Colusa and Tehama—E. J. Lewis, D.\*

#### Assemblymen.

Alameda—J. E. Farnum, R.; R. H. McClure, R.; M. W. Dixon, D.  
Amador—Thomas Dunlap, D.; Robert Ludgate, D.  
Butte—Gibbert H. Neely, D.; M. Brooks, R.  
Contra Costa—Albert J. Young, D.  
Calaveras—A. R. Wheat, D.  
Colusa and Tehama—T. J. Hart, D.  
Del Norte—J. E. Murphy, D.  
El Dorado—J. H. Miller, D.  
El Dorado and Alpine—S. A. Nott, D.  
Fresno—R. P. Mace, D.  
Humboldt—Joseph Buss, R.  
Inyo and Mono—S. P. Moffat, D.  
Los Angeles—Asa Ellis, D.; J. E. Holloway, D.  
Lake—S. K. Welch, Ind.  
Mariposa and Merced—Andrew Ewing, D.  
Marin—Charles D. Allen, R.  
Mendocino—L. F. Long, D.  
Monterey—C. S. Abbott, R.  
Napa—J. M. Mayfield, D.  
Nevada—G. W. Giffen, D.; M. Garver, D.; S. L. Blackwell, D.  
Placer—M. C. Wilson, R.  
Plumas and Lassen—J. H. Whitlock, R.  
San Francisco—Ninth District—J. V. Coffey, D.; M. C. Conroy, R.; A. J. Griffith, D.; C. H. Gough, D. Tenth District—W. B. May, R.; R. W. Murphy, R.; S. B. Blake, R.; G. Barstow, D. Eleventh District—W. F. Anderson, D.; J. A. Hicks, D.; J. E. Connolly, D.; J. Haworth, D. Twelfth District—W. Broderick, D.; C. Gildea, D.; J. J. Tobin, D.; W. Amussen, D. Thirteenth District—J. F. Swift, I. R.; S. W. Backus, R.; W. K. Forsyth, R.; J. H. Dinnene, D.

Sacramento—Joseph Routier, R.; Grove L. Johnson, R.; Reuben Kercheval, R.  
San Diego—Fred N. Pauly, R.  
San Bernardino—Byron Waters, D.  
San Luis Obispo—L. M. Warden, D.  
Santa Barbara and Ventura—Caleb Shorman, D.  
Santa Clara—Rush McComas, R.; Wm. Hanna, D.; C. W. Union, D.  
Santa Cruz—George Pace, D.  
San Benito—James F. Ereen, R.  
San Joaquin—R. C. Sargent, R.; G. Myers, R.; R. B. Thompson, Ind.  
San Mateo—J. P. Ames, R.  
Sierra—Lewis Rytting, D.  
Siskiyou and Modoc—P. C. Robertson, D.  
Stanislaus—C. Dorsey, D.  
Solano—R. C. Hille, D.; John T. Dare, D.  
Sonoma—B. F. Tuttle, D.; E. C. Hinshaw, D.; C. H. Cooley, R.  
Sutter—C. P. Berry, D.  
Trinity and Shasta—J. C. Montague, D.  
Tulare and Kern—W. S. Adams, D.  
Tuolumne—Edward Smyth, D.  
Yolo—W. M. Dewitt, D.  
Yuba—E. F. Hugg, D.; D. A. Ostrom, D.

#### Recapitulation.

SENATE.	
Democrats	28
Republicans	11
Independent	1
ASSEMBLY.	
Democrats	54
Republicans	24
Independent Republican	1
Independent	1
JOINT BALLOT.	
Democrats	82
Republicans	35
Independents	3
Total	120

### Dangers of Coal Mining.

The following extract from the report of Samuel Gay, one of the mine inspectors for the anthracite coal fields of Pennsylvania is taken from *Seward's Coal Trade Journal*:

Another prolific source of danger in mining anthracite coal arises from the large amount of powder used for mining purposes, as nearly all the coal has to be blasted. One keg of powder, weighing 25 pounds, is usually used for every 50 tons of coal sent to market.

The accidents which occur from the use of powder in the mines are due to various causes, and the miner is endangered in several ways, but the greatest danger arises from not using the precautions which are necessary in handling so dangerous an explosive. The mode generally in practice with the miners in making up the powder into cartridges for the purpose of blasting is extremely reckless. Generally they hold the keg containing the powder under one arm and the cartridge in the other hand, with their lamps hanging on their heads; and, besides, almost always, this work is done in some small heading, where there is not room enough to turn around even when on their knees.

Another source of danger arising from the use of powder is when a cartridge is being inserted into the hole which has been bored to receive it. The cartridge is pierced with what the miners call a needle, which is made of iron, varying from three to five feet in length, and about five-eighths of an inch in diameter at the large end, drawn on a regular taper, to a fine point. Should this needle be driven to the back of the hole while inserting the charge or shot of powder, there is danger of striking some flinty or fiery substances, which are found to a greater or less extent in all minerals, but more so in anthracite than in bituminous coal. There is also danger in the process of tamping the hole, which is also done with an iron tamping bar, unless great care is taken not to break the cartridge while inserting it.

In either of the above cases there is danger of a premature explosion of the powder in the hole, and oftentimes the most fearful accidents that can befall a human being occur from them. Sometimes the results are fatal, and at other times miners are blinded or injured and named for life.

There is also another source of danger, and probably the greatest of all arising from the use of powder in blasting. It is from shots which fail to explode at the time generally allowed by the miner for the match to ignite the powder in the squib, although this source of danger may have been somewhat lessened within the last few years by the invention of the "Daddow's patent squib and match combined," which is now used very extensively in the anthracite coal mines; nevertheless there is still a large percentage of accidents occurring from this source. The length of the match which is connected with the squib is regulated according to the distance the miner has to retreat to a place of safety, and it is upon his practical judgment alone that he must rely to measure the time necessary to be allowed. Through various causes the match oftentimes fails to ignite the powder in the squib, as soon as the miner thinks it should. (This is often the case, as a large percentage of the holes cut small springs of water in passing through the various partings or slips which run at all angles through the coal seams.) Upon the impulse of the moment, from fear of losing the powder and also the labor of boring the hole out again, he rushes back to the face of his working place, without consulting his own safety, to apply another squib or match as the case may require, apparently unconscious that the jaws of death are almost ready to swallow him. Nevertheless he knows the danger, if a practical miner, for he is aware that these matches burn very freely up to near the powder and then the fire almost burns out, but still continues to smolder slowly, but so dimly that it

cannot be seen until the miner is close upon it, or perhaps in the act of catching hold, when the powder becomes ignited. We have known cases when the miner has lived to tell the tale that when in the act of taking the squib from the hole he has in doing so pressed the fire on the powder, causing the explosion of the shot. When these accidents occur they are generally attended with fatal results.

There is also another source of danger which is connected with the use of powder in general. This danger is to be apprehended in mines generating explosive gases. In the first place, if the naked light is used it is dangerous to apply the open light to the match in lighting it, as there is always great risk of igniting feeders or blowers which the bored hole has liberated. In such cases there is danger of the burning gas igniting the powder in the squib before the miner has time to retreat to a place of safety.

There is also danger of explosions should there be any standing gas (carbureted hydrogen); but if in our most fiery mines the use of powder or other explosives was prohibited, the consequence would be that some of the most valuable collieries would have to be abandoned, or the consumers of this fuel would have to pay such high prices that it would be only very few that would have the pleasure of using anthracite coal.

Powder, as a matter of course, is used in bituminous coal mines, but not nearly to so large an extent as in the anthracite mines, and then only under very stringent rules. It has been deemed necessary to have stringent laws passed in regard to the use of powder where it is only used in small quantities, we think it is much more important to have strict laws here where we use such large quantities. We are sorry to say that there is neither law nor discipline in the use of powder in the anthracite coal fields.

SETTLING.—The ground along F street, near Union, and on Union street, yesterday, was found to be settling. The water and gas pipes were broken for the distance of about 100 feet on F street, and large cracks in the ground were opened, into one of which an ice wagon sank to the hub. There seemed to be a side movement to the east as well as a gravitation of the earth in that section. The veranda in front of Mr. Kelley's house was drawn away from the upright pillars to a considerable extent, and portions of the bulkhead were thrown out of plumb. The gas company took the precaution to dig the earth from underneath their pipes, so that they would settle evenly and not break. The center of the street had settled about five inches at noon, and was still slowly receding last evening. Another crack was discovered on Taylor street, near the Episcopal church. Of course the only cause of this is the giving way of the earth where mining has been done underneath. It is the opinion, however, of those best posted in these matters that if the whole timbering was taken out of the big bonanza, too swelling of the vein would be so great as to shut up the entire space, so that no effect would be perceptible on the surface, or, at least, none appreciable except by the running of nicely adjusted machinery. The operations of yesterday were doubtless caused by workings nearer the surface. The excavations in the Consolidated Virginia under the place where the ground settled are at least 1,500 feet under ground.—*Virginia Enterprise*.

DESERT LAND INVESTIGATION.—A dispatch from Washington, dated Oct. 30th says: The Commissioner of the General Land Office, acting under direction of Secretary Schurz, to whom he referred the matter, will shortly issue additional instructions regarding the investigation of suspended desert land entries. These supplemental instructions will provide that the notice for taking testimony shall be served by mail upon the person in whose name the entry was made, if his residence is known, and by publication in a newspaper in the county embracing the tract, if his residence is not known. They also require inquiries to be made whether the applicant knew the character of the land before the entry was filed, and if so, for how long a period; whether he himself paid the first installment, or if it was advanced by any other person, by whom; and whether he has conveyed, assigned or mortgaged, or agreed to convey, consign or mortgage the land; and if so, upon what consideration. Local land officers are furthermore specially instructed to obtain testimony as to the character of the land from other persons than those applying to enter them.

IMMENSE PIPE LINE PUMP STATION.—A correspondent of the *Oil City Derrick* says the American Transfer Company are building two of the largest pump stations in the world. One of these is located at Carbon Center and the other at Freeport. The boilers, engines and pumps are enormously large and powerful, the latter being the largest ever manufactured, the cylinder having a diameter of 30 inches. In each station are three 60 horse-power boilers, with engines to correspond. Instead of iron smoke-stacks, such as are commonly used, brick chimneys 60 feet high will be built. The company expect to be ready to pump in about two weeks. In the line from Bullion to Oil City, and with but one station, they throw 3,300 barrels a day, and if pressed can throw 4,000 barrels. The Pittsburg line has a capacity of 6,000 barrels per day, and instead of having four stations, as was at first urged by the company, Mr. A. C. Beeson, the manager, said he could do it with one; and this he proposes to do with the splendid machinery above mentioned.



## MECHANICAL PROGRESS.

## The Field Still Open for Inventors.

Those who sometimes conclude that the rapid progress of inventions has brought to us the borders of the inventor's field, do not perceive the crowning needs of men which remain unprovided for. A writer in the *Polytechnic* hints at some of the directions which still lie open for inventor's triumphs as follows: Ramie and other fibers still defy the textile art. And the Indian Government has offered two prizes for the best machine for the preparation of the ramie fiber. The first prize is one of \$25,000, and the second of \$5,000. The gorgeous aniline dyes fade with a summer's sun. Household fires, once synonyms of health and cheerfulness, are now gloomy and noxious monuments of our heedlessness of things sanitary. The domestic conveniences that should minister to our comfort and well-being, poison us insidiously but surely. Our vaunted gas-lights blacken our paint and kill our window plants, while in the street, the pipes which lead the gas destroy our shade trees. Our sewers and our drains are confounded in name and use, and both of them are poisonous. Our chimneys breathe forth smoke which is unconsumed fuel, and hence wasteful. Our steam boilers, with partly consumed fuel supply our engines with wet steam, and the engines (whose cylinders have to be supplied with oil, through faulty design and workmanship) wastes part of the remainder. Our horses, shod with no regard for humanity or for tractive effect, draw wagons or cars which rattle our teeth out, on roads or rails which rattle the vehicles to pieces. The explosives which long ago were constrained to throw hurtful missiles for miles, have but in one instance—blasting—been employed in peaceful work; if we may except the gunpowder pile driver, the precursor of a long line of explosive motors yet to come. There is yet no machine which will satisfactorily and economically compete with nature in supplying a commodity now so great a necessity. The science of aeronautics to which the veteran Wise and others have devoted so much time and skill, and which they have demonstrated to be far within the bounds of safety—has not been developed from flotation to guidance—still less propulsion. A spark of fire has terrors greater than those of the avalanche or the glacier.

For these and hundreds of other evils, inventive genius must provide the remedy; and as new and artificial wants arise and develop into necessities, upon the inventor, ever in the vanguard, devolves the duty of exploring the land of the possible and providing for the legions of the actual.

**THE JEWELRY INDUSTRY OF THE UNITED STATES.**—We read in the report of judges of group XI., Centennial exhibition, that according to the data of 1871, the last year of the war tax, the jewelry manufacture at Newark, N. J., alone, upon which that tax was paid, amounted to eight millions of dollars, and in the city of New York, the same year, it was between six and seven millions. The number of working jewelers in the United States is estimated at 25,000 to 30,000. Of these Massachusetts has about 1,500; Rhode Island, chiefly in the city of Providence, 2,500; Newark, N. J., about 60 establishments, and nearly 2,500 workmen; and the city of New York about 6,000 workmen. In some of the jewelry manufacturing factories are employed, in ordinary times, from 300 to 400 men. There are also in the United States about 12,000 watch and jewelry stores of importance. Connected with these is always a force of watch repairers and working jewelers adequate to the business of each individual establishment.

**SQUARE SHOULDERS TO PIVOTS.**—A correspondent of the *Horological Journal*, having asked for the best method of making the beautiful square shoulders to pivots as seen in the best English watches, is told: "First, the pivot and shoulder must be turned square and cut smooth. In order to do this perhaps it is unnecessary to add that you must attend to all the minor details, such as good centers to your turns and on the pinion. A true ferrule, and a long stroke with your drill bow, and a good graver, are also necessary. Then take a pivot polisher carefully filed up (this polisher, as is well known, is made of flat steel with the edge beveled off the same as a pivot file), and with sharp red stuff work it on the pivot and shoulder, being careful to keep the polisher at right angles with the pinion, and occasionally allow the polisher to travel in the same direction as the drill bow. Finish off with fine red stuff."

**PROGRESS.**—Among the more noteworthy exports from the port of New York in the week ended October 9th, says the *American Manufacturer*, were \$6,750 worth of sword blades and \$100 worth of steel to Rotterdam, \$100 worth of cutlery to Havre, \$274 worth of Britannia ware and a \$1,900 carriage to London, two locomotives valued at \$20,600 and \$225 worth of pig iron to New Zealand, \$720 worth of pig iron to Mexico, and saws and muskets to British Anstralia.

**KEELEY.**—We now read in Eastern exchanges that the "Keeley motor" is pronounced an unmitigated humbug by those who have examined it.

## Burnished Gilding on Glass.

A foreign publication, *Design and Work*, gives the following practical instructions: In the first place it is necessary to make a size for fixing the gold leaf to the glass, which is made in the following manner: Obtain some best isinglass, and place as much in a teacup as will cover a shilling piece; then pour half a cupful of boiling water upon it; then add as much spirits of wine as water in the cup, strain the whole through a piece of fine cambric or a silk handkerchief; when cold it is ready for use. Whatever writing or ornament you require to put on the glass must be first drawn or set on paper the exact size of the glass. When you have made your design or letters on the paper (with a lead pencil) the size you require, prick the outlines through with a fine needle, placing the paper on a piece of smooth, soft wood, so that it does not blunt the point of the needle (and make the holes unnecessarily large). When this is done, clean your glass thoroughly; then place your design, reversed, to back of the side you mean gilding, fixing it with a little gum at each corner; then place your glass in a slanting position. Take a large size swan-quill pencil, and flow the size on where you require the writing or ornaments; then commence gilding, putting your gold out on a cushion, and cutting it the proper sizes, or of such sizes as you can easily take up with the tip. Let each joint overlap the other, gilding the whole space where the writing, etc., is to be, having the gold about one-fourth inch wider at top and bottom of the letters. When you have completed the gilding so far, the glass should be set upright to drain the surplus size off, and near a fire, or in a warm place, to dry. When dry, which you will ascertain by its assuming a burnished appearance, take a piece of cotton wool and rub it over very softly. By this means you will remove all the loose pieces of gold, and increase the burnish of the gold. If there are any faulty places in the gilding, flow a little size on the place, and put a piece of gold over it, rubbing the place so repaired gently with cotton wool, when dry. Then use a large flat camel-hair brush, and size the whole of the gold over lightly, so as not to disturb the gold. When this is dry, pour some hot water over the gilding, which enhances the brilliancy of the gold very considerably. When dry, which it will do in a very few minutes, size it over softly to prevent the paint from percolating the gold. Having completed your gilding, you take your design off the back of the glass (which enabled you to see how far to gild), and place it on the gilded side, reversed, taking care to fix it securely, so that it shall not move, while you pounce it over with a white pounce softly; then raise the paper off the glass carefully, so as not to brush the pounce marks away. You will then have the outlines of your design left on the gold. Take a sable writing pencil, and fill up the outlines with Brunswick black of as thick consistency as you can work it with the pencil; when this process is quite hard, take a wet sponge, and gently wash all surplus gold off clean. Then take a small straight-edge and a chisel, and cut the top and bottom of the letters, etc., quite straight and true. This process is called trimming, by which means you obtain a sharpness of outline that you could not obtain with the pencil, however expert you may be. You may then shade in what color you think proper, and paint whatever color background over all to suit your fancy.

**A ROCK BORING DEVICE.**—We read of a new device for rock boring, which consists of a cylinder and a piston rod with two pistons thereon. Steam, air, or other elastic fluid is introduced into the middle of the cylinder, and acting on one or other of the pistons closes the exhaust, and forces the steam or air from one piston to the other piston. This is effected by one or other of the pistons coming into contact with a slide valve, which, at the proper time closes the required port or ports, leaving other port or ports open. The drill being fixed or attached to one end of the piston rod is automatically fed into the rock at every blow of the piston by means of a small cylinder fixed to the side of the above named cylinder, and so arranged that steam or air will pass from the large or first named cylinder to the small cylinder, and act upon suitably arranged catches and wheels; or we may introduce the steam or air into the middle of the slide valve, and use the body or space between the two pistons for the purpose of exhaust.

**INCUSTED BRONZE.**—Incrusted brouze, says the *Jeweler*, is the name of a Parisian novelty in bronze or copper ware, with gold and silver ornamentation. To fix the gold or silver ornamentation on articles of bronze or copper, they are first painted in water colors, the principal ingredient of which is white lead. When several articles are to receive the same drawing, it may be printed in the same manner as in porcelain painting. The places which remain unpainted are varnished. The article is then laid in dilute nitric acid, which dissolves the color and bites the metal on the painted places to the required depth. After washing the article it is placed in a silver or gold bath, where the free surfaces are electrolytically silvered or gilded. The varnish is then removed, and the whole surface is polished so that the gilded and silvered parts are not unduly prominent. The article can then be bronzed. A fine effect is produced with black bronze by sulphuret of copper in the spaces between the gold and silver.

## SCIENTIFIC PROGRESS.

## Catastrophism.

According to a review by Prof. R. W. Raymond of a late address by Prof. O. C. Marsh, on "The Introduction and Succession of Vertebrate Life in America," Prof. Marsh's summary of the work thus far accomplished in American paleontology forms, incidentally, an interesting companion-piece to the recent address of Clarence King, whose conclusions were drawn chiefly from stratigraphic and dynamic geology. Mr. King's biological theory is, however, relegated to its proper subordinate place as a part of the Darwinian evolution. Says Prof. Marsh: "As a cause for many changes of structure in mammals during the Tertiary and Post-Tertiary, I regard, as the most potent, *Natural Selection*, in the broad sense in which that term is now used by American evolutionists. Under this head, I include not merely a Malthusian struggle for life among the animals themselves, but the equally important contest with the elements and all surrounding nature. By changes in the environment, migrations are enforced, slowly in some cases, rapidly in others; and with change of locality must come adaptation to new conditions or extinctions. The life-history of Tertiary mammals illustrates this principle at every stage, and no other explanation meets the facts."

Prof. Marsh, like Mr. King, explains the "almost total absence" of the remains of fishes from the Miocene lake-basins of the West, by the theory (which he says is, "perhaps the best") that "these inland waters, like many of the smaller lakes in the same region to-day, were so impregnated with mineral matters as to render the existence of vertebrate life in them impossible." This theory, argues Prof. Raymond, seems to involve the conclusion that the Miocene lakes had no outlets. There are lakes, large or small, with which we are acquainted in the West, which, having outlets, are thus impregnated with mineral matter. Utah lake, deriving its water from the same country which furnishes the supply to the Great Salt lake, is fresh, and swarms with trout. Even the Sink of the Humboldt, which has no outlet except the seepage of its waters under the surface for some distance further down the valley, is but slightly brackish. But if the Miocene lakes were entirely without drainage, and therefore saline, why is the absence of the remains of fishes not total, but only "almost total?" One fossil fish, we should think, would be a troublesome fact for this theory, unless, indeed, it be assumed that the individual lived in a river by choice, and found his way unwillingly to a lacustrine sepulcher. A paucity of fishes might, perhaps, be accounted for by the otherwise probable supposition that the Miocene lake outlets found their way over precipitous cataraacts to the sea. The Columbia and Colorado river systems show the remains of such escarpments plainly enough.

**CLIMATIC CHANGES IN EUROPE.**—A Swedish paper just received, says *Nature*, publishes an interesting article under the heading: "Why is the Climate of Europe growing Colder?" The article states that in the Bay of Komenok, near Koma, in Greenland, fossil and very characteristic remains of palm and other trees have been discovered lately, which tend to show that in these parts formerly a rich vegetation must have existed. But the ice period of geologists arrived, and as a consequence of the decreasing temperature, this fine vegetation was covered with ice and snow. This sinking in the temperature, which moved in a southerly direction, as can be proved by geological data, i. e., the discovery of fossil plants of certain species, seem to be going on in our days also. During the last few years ice has increased far towards the south; thus between Greenland and the Arctic sea colossal masses of ice have accumulated. On European coasts navigators now frequently find ice in latitudes where it never existed before during the summer months, and the cold reigning upon the Scandinavian peninsula this summer results from the masses of ice which are floating in the region where the Gulf Stream bends towards our coasts. This is a repetition of the observations made in the cold summer of 1865. The unaccustomed vicinity of these masses of ice has rendered the climate of Iceland so cold that corn no longer ripens there, and the Icelanders, in fear of a coming famine and icy climate, begin to found a new home in North America.

**A RIVER OF INK.**—The Cumberland *Alleghanian* states that the water from the mines above Cumberland is impregnated with sulphate of iron, the result of the oxidation of sulphuret of iron in the coal, and flows into Will's creek. The report goes on to say: "The creek is now very low and but a very small body of water flows down its bed. At the head of the city are two extensive tanneries, and in the tanning of hides large quantities of tannic and gallic acids are poured into the stream. As soon as these acids come in contact with the sulphate of iron the water becomes black, as is now the case in front of our city. There are millions of gallons of ink now lying in the bed of the creek, which needs but bottling and packing to make a salable article for exportation."

**WHAT HOOKER AND GRAY WILL DO?**—As these distinguished investigators have lately explored our coast and the great central region, it will be of interest to know what they propose to do with the data gained. A letter written to Dr. Hayden by Sir Joseph Hooker, a day or two before his departure for England, outlines some important botanical work projected by himself and Dr. Gray, of Harvard. The following is an extract of the letter: "We shall hope to take Colorado as a central point for opening out the main features of the flora of North America, and discuss them in relation to it and to one another in a rather detailed manner. We hope to bring out clearly the contrasts between the Rocky mountain flora and that of the forest regions of the East and West, including in the botanically defined Rocky mountain region the whole of central unforested North America from the west of the Mississippi to the base of the Sierra Nevada. The region thus defined will be divided into, first, an eastern plain; second, a central Rocky mountain district proper, extending from Pike's peak to the Wasatch range; third, a western district, that will include the desert country. The Rocky mountain proper district again will be divided, vertically, into an Alpine, and, perhaps, a sub-Alpine and lowland flora. The comparison of the flora with that of the mountain ranges of Asia and Europe will follow; and then we must see what we can do in the way of correlating any of the features with the glacial epoch and Lesqueriaux's vegetable fossils." Sir Joseph Hooker expects to return to the United States in a few years, for the purpose of making the flora of the Atlantic coast an object of special scientific research.

**COMBUSTION OF PETROLEUM.**—It appears from the reports of the workmen in the various petroleum refineries that fires often break out in them in spite of all precautions, and without any visible cause. The *American Review* is authority for the statement that persons familiar with the refining of petroleum also say that, if cold water is poured on warm oil for the purpose of cooling it, the oil will sometimes suddenly ignite. It is unfortunate that, in this case, it is not certain whether it was water or steam which was applied, but if the fire arose from chemical action, the composition of the two substances was the same, only the high temperature and vastly extended condition of the oxygen in the steam might have caused it to unite rapidly with the carbon of any of the more volatile portions of the partially refined oil, which might, by imperfect process, have been allowed to enter the agitator. Petroleum is not spontaneously ignitable in air under ordinary atmospheric conditions, but it is well known that spontaneous combustion, though generally slow in inception, often occurs rapidly from the quick absorption of oxygen from water or damp air by highly carbonized substances, of which special instances may be mentioned in lamp-black works, and places where charcoal finely pulverized is used.

**ARCTIC COAL.**—English reports state that coal has been found in latitude 81° 44' north and 65° 3' west, now known as the Discovery bay. It was found in the side of a narrow mountain gorge. The prevailing rock of the surrounding district was a shining claystone of an irregular arrangement, but mainly dipping to the westward, and so far as could be ascertained, devoid of fossils. Vegetation included no less than 60 species of plants. Coal had been brought home on previous expeditions from high latitudes but not so far north. The coal (specimens of which were exhibited) has a bright, shiny appearance, is somewhat of a pitchy character, and very brittle. On analysis it could not be distinguished from a bituminous coal of exceedingly good quality, and belongs to the true carboniferous period. It is very similar to coal found in some English coal fields, and particularly in Chesterfield. It contains 65% of coke.

**NEW SPECIFIC GRAVITY MACHINE.**—A new densimeter submitted to the Academy of Sciences, Paris, by M. Gosselin, is very simple in construction and operation. A wooden rule is suspended by a wire attached to some convenient point other than the central point. To the long arm a weight is attached sufficient to balance the body to be examined hung at the end of the other. The latter is immersed in water, and the weight on the longer arm is moved until the rule is again horizontal. A scale on this arm shows at once the density of the body at the point occupied by the weight.

**COMPRESSIBILITY OF LIQUIDS.**—E. A. Amagat has conducted a series of investigations on the compressibility of volatile liquids, when the liquid state was maintained by pressure at a temperature higher than their boiling point. The experiments were carried to a pressure as great as 39 atmospheres, the results being in the most satisfactory accordance with deductions from the mechanical theory of heat.—*Comptes Rendus*.

**SEEDS IN SEA WATER.**—*Guilandina Bonduc* is a West India tree of the Leguminosae family, with a seed as large as that of our Kentucky coffee. Some seed carried by ocean currents to the shores of Cornwall, in England, germinated, on being sown by their finder. They must have been at least three months on their journey, all the time soaked in sea water; and their germination under these conditions show how plants may have migrated from place to place even by the intervention of the sea.



60	Alta	.....	10	Rock Island	.....	30c	Cuba ruined during the war and which are in the way of reconstruction, free from contributions for five years; also, every new estate and all new property acquired in the Central and Oriental departments. All industries and commerce in these departments, newly established, will be exempt for three years. All female cattle imported with the exclusive object of raising stock, will be duty free for two years
40	Belcher	.....	45	Solid Silver	.....	41 1/2c	
310	Bullion	.....	5	Sierra Nevada	.....	3.90 1/2c	
150	Best & Belcher	.....	70	Savage	.....	81	
20	Yastore Con.	.....	1	Silver Hill	.....	10	
300	Benton	.....	120	Trojan	.....	11 1/2c	
50	Confidence	.....	10	Utah	.....	13 1/2	
30	California	.....	10	Ward	.....	90c	
25	Chin	.....	20	Ward	.....	90c	
370	Crown Point	.....	25	Yellow Jacket	.....	5 1/2	
250	Con Imperial	.....	20		.....		
40	Caledonia	.....	370	ARGENTON SESSION.	.....		
20	Dayton	.....	30	Argentina	.....	11 1/2c	
20	Eschschmer	.....	30	Alta	.....	10 1/2	
250	Gould & Curry	.....	70	Belcher	.....	4.80 1/2c	
110	Hale & Nor	.....	70	Best & Belcher	.....	17 1/2c	
190	Justice	.....	70	Bullion	.....	6.70 1/2c	
310	Keokuk	.....	300	Benton	.....	1.40	
20	Lehigh	.....	300	California	.....	2.10	
450	Mexican	.....	10	Con Virginia	.....	25 1/2	
500	North Carson	.....	65	Crown Point	.....	5	
395	New York	.....	100	Con Imperial	.....	75c	
410	Onida	.....	50	Caledonia	.....	2 1/2	
150	Omaha	.....	30	Consumption	.....	2 1/2	



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## THE ENGINEER.

### Sounding for the Channel Tunnel.

In the latest reports of M. M. Polier and Lapparent upon the soundings for the channel tunnel in which they give the result of the numerous soundings which they have taken during the last 18 months for the purpose of ascertaining the thickness and impermeability of the different strata in the channel, they state that "observation shows that the soil under the sea preserves the same characteristic as upon the French mainland—that is to say, a line traced upon the surface of one of the beds of chalk consists of long straight lines connected with one another with very pronounced sinuosities. Observation has also shown—and this is a capital point with regard to the making of the tunnel—that in these sinuosities, of which there are two in the channel, the strata are evidently continuous, and that the distance between the two successive lines is filled up, not by a fissure, but simply by a curve. There is, therefore, no reason for anticipating that the work will encounter any geological difficulties, properly so called, if we bear in mind the information furnished by a study of the sea's bed and by the work done in the mines which run down into the chalk. The boring at Sangatte has not been carried far enough to admit of any definite opinion being given as to the jurassic development of the soil in that region, but it has confirmed the deductions drawn as to the progressive diminution in thickness of strata below the chalk which runs from Boulogne toward Calais. These strata are formed of sand and clay, with an admixture of paleozoic pebbles, red calcareous and carboniferous marl, but without any rock of the coal order.

**THE HUDSON RIVER TUNNEL.**—The work upon the tunnel under the Hudson river, between Jersey City and New York, which has been delayed for some time by litigation, it is now stated, will be resumed early this fall. *Engineering News* says: A shaft 28 feet deep has been dug at the foot of Fifteenth street, Jersey City, and this depth will be increased 20 feet. From this as a starting point, the tunnel will proceed in a northeasterly direction under the Hudson river and the Christopher street ferry slip. The entrance on the New York side will be in the neighborhood of Washington square. From Jersey City the grade will descend two feet in every 100 feet, until a point 2,700 feet from the New York side is reached, when it will begin to ascend at the rate of one foot in every 100 feet. The tunnel will be two miles in length, with a road-bed 23 feet wide and two separate tracks. Through its entire length it will be lighted by gas. The wall will be constructed of brick, with a thickness of four feet. At no point will the top of the tunnel be less than 35 feet below the surface of the water, and in many places it will be 70 feet below. One hundred and twenty laborers will be engaged in the construction of the tunnel. The work will go on during the whole of the 24 hours, the force working in three relays, of eight hours each. Although the tunnel will be used for the conveyance of passengers, its main object will be the transportation of freight to and from the great railroad lines which terminate in Jersey City. The capital of the company is \$2,000,000.

**NEW DOCKS ON THE CLYDE.**—A few weeks ago extensive new docks were opened at Stobcross, on the Clyde. The depth of water in the dock is 20 feet, and the entire cost will be about £1,600,000. When the dock is entirely finished the water-surface will extend to 34 acres, the length being 3,000 feet, and the breadth 700 feet. Access to the basin, which is a tidal one, is obtained at the south-west extremity, the passage being 180 feet in width. On the north side the wall of the quay is founded to the depth of 41 feet below the level of the quays. A central quay passes from the eastern end parallel with the north and south side walls, separated from them by water-ways for distance of 270 feet, with a uniform breadth of 195 feet. The water-space between the western end of this quay and the west wall of the dock forms a canting ground, and is of such dimensions as will permit of the largest vessels being moved and turned about with every freedom. A strong iron bridge on the swing principal has been placed at the entrance to the dock, and although it weighs 800 tons, is 181 feet long, and 40 feet broad, can be moved from one side to the other in a minute and a half. The bridge is worked by hydraulic power supplied from an engine-house placed in the vicinity, and which, by means of pipes, can be connected with cranes and similar machinery at any portion of the dock. The engine-house is a handsome building, and is surmounted by a tower in which a clock and a chime of bells have been placed.

**CURIOUS TRACKLAYING.**—The *Railway World* says that an interesting experiment was carried out last month by a detachment of the German "railway regiment" in order to determine the rapidity with which a line of rails could be laid down over ground presenting considerable difficulties, and also to ascertain the rate at which work could be continued during the night by the aid of electric and other artificial lights. The portion of railway constructed, led from the station of Klausdorf to

the summit of some adjacent heights, rising 50 or 60 feet above the starting point. Its length was about 1,000 paces, and the gradients were, therefore, necessarily steep, in some places being as high as one in 20. The work was begun at 7 o'clock in the morning, and by midday the rail were laid on the lower and more level half of the road. In the evening the workmen were relieved by other companies of the regiment arriving from Berlin, and, although there was no moon, the work was steadily continued. Torches were employed where excavations or embankments had to be made; but where more accurate work had to be executed or more difficult operations had to be performed—as, for instance, where rails had to be laid and adjusted—the scene was illuminated by electric lights arranged upon an elevated platform. Shortly after midnight all the heavy work was finished. In two or three hours more the rails were finally adjusted; and in the morning the regiment returned to Berlin.

**A GREAT WORK IN HOLLAND.**—The latest and in some respects the most important of the many remarkable engineering works of Holland, says the *Railway World*, is the new railway bridge over the Maas at Rotterdam. This work, after an expenditure of nearly 2,000,000 florins, of which rather more than half has been expended on the superstructure, and less than half for the substructure, has been completed within eight years, about the same time required for the construction of a similar bridge at Hamburg, and that between Venice and the continent. Five gigantic wrought iron arched girders, resting on immense piers, and of spans, ranging from 216 feet 6 inches to 295 feet 4 inches, and a height of nearly 20 feet above ordinary high water level, connect the city with an island in the middle of the stream, two other arches uniting this island with the opposite shore. Another great work at Rotterdam is now in course of completion, which has attracted general attention on the continent. A few paces below the railway bridge, another bridge, the so-called "Willembrug," to serve for the ordinary carriage traffic of the city and foot passengers, is in course of construction. The foundation stone of this bridge was laid three years ago by the King of Holland in person. This, like the railway bridge, is provided with two pivot arrangements, of which one is within the city, the other in the canal called the King's Harbor (Koning's Haven), 656 feet wide, between the opposite shore and the island above mentioned, to permit the passage of the largest ships.

**RECLAIMING THE EVERGLADES.**—The engineer now attempts the turning of the historic everglades of Florida, into fruitful fields. A writer in the *Engineering News*, says that it has been for some time known that the surface of the everglades is elevated between four and five feet above the waters of the ocean, and the scheme of draining this immense territory has been advanced. There is now some prospect of the realization of the project, as parties in New York, representing abundant capital, have taken hold of the matter, and an engineer has been employed for some time making investigations. This is a subject that will well repay examination, for here are 5,280 square miles of the richest land in the world, capable of raising \$600 worth of sugar per acre, without any fertilizers. This land, once drained, would far exceed in value the *polders* of Holland, owing to its semi-tropical position and its adaptability for the raising of bananas, sweet potatoes and all tropical fruits. The report of the engineer making the preliminary survey is looked forward to with lively interest by all Floridians and others who are aware of the capabilities of this region.

**MR. EADS' PAY FOR THE JETTIES.**—Inasmuch as the engineering works in the mouth of the Mississippi are showing practical success, it is interesting to recall the terms of the contract. The *American Manufacturer* says: The terms of the bill provided for a payment in all of \$5,250,000, this amount to be paid in installments, subject to certain conditions. The first payment was made in February last for a channel 20 feet in depth, by 200 feet in width of that depth, and consisted of \$500,000. For every additional two feet in the depth of the channel, each depth of specified width, he is to receive \$500,000, while after a channel 24 feet in depth has been obtained he is to receive \$250,000 for maintaining it, with a like amount for preserving each additional depth of two feet. When a channel 30 feet in depth by 350 in width, which is the desired channel, is obtained, \$4,250,000 will have been paid, the remaining \$1,000,000 to be held as security by the Government, \$500,000 of which is to be held for ten years. He is also to receive \$100,000 per annum for maintaining this channel 20 years.

**COUPLED-LEVELING INSTRUMENT.**—Engineer Aita, being charged with the survey of Padua for drainage and water-service, devised a coupled level which remedies many of the surveying difficulties of tortuous and narrow streets. It consists of two glass tubes, doubly clamped to graduated staffs, and connected by a caoutchouc tube of any desired length. The two clamps are movable, the glass tubes being partly, and the connecting tube wholly filled with water. The observer at each end brings one of the clamps to the water level, and enters the scale-reading in his note book. When the books are compared, the difference of readings give the difference of altitudes.

**RESISTANCE OF RAILWAY CURVES.**—A writer in the *Railway Age* says: Much has been said and written about railway curves, and most engineers differ in regard to them. My practice in the location of roads is somewhat different from the usual formula, by which curves are "flattened" upon grades. The speed of trains I consider an important element in comparisons, and it is fixed upon my roads from eight to ten miles per hour, and up to 12. An ordinary equation of curvature to grade is a radius of 400 feet to a grade of 26 feet per mile. I found that a curve of such radius is only equivalent in the practical working of my road to about 21 feet per mile. I give the result of my experience as a useful physical fact, inasmuch as ordinarily there is little knowledge of the resistance of curves. It must not, however, be overlooked that in this case the speed is that of slow burden trains.

**A STONE BRIDGE.**—One of the most notable examples of bridge-building enterprise in the world is that just completed by the North British Railway Company across the estuary of the river Tay. The structure is nearly two miles long, consisting of 85 spans, varying in length from 67 to 245 feet. In the central part the bridge has a clear height of 88 feet above high water. The 13 largest spans, forming about a third of the structure, are placed over the navigable part of the river. They rest on 14 great piers, the foundations of which are immense caissons. From the top of the highest girder to foundation, the structure of stone, concrete and iron is not less than 150 feet high. The work on this great structure was commenced in 1871, over six years ago. It is built for all time.

### Lucky Strike.

The attention of the mining public, says the *Boulder County News*, of Oct. 26th, has been turned this week towards Sunshine gulch, where one of the most promising strikes of the season has recently been made. The Warsaw tunnel is owned by C. W. Smith, Superintendent of the Grand View mine, at Sunshine, Geo. W. Walton and E. White. It is located on what is known as Warsaw hill, on Sunshine gulch, about a mile from the camp. There are two tunnels opened on the vein, the lower one having been run a distance of 220 feet into the hill, and the upper one, the mouth of which is about 200 feet up the hill, is now in 100 feet. The upper tunnel has been producing some pay ore for the last 30 feet, but until within a week has not promised any more than ordinary returns. About a week ago, however, they came upon a widening of the vein, which, as they went in, has developed itself into a chimney of rich ore that promises to make them a great deal of money in a short time. Up to this writing they have taken out about 100 pounds of ore of almost unequal richness. Forty pounds of it, that has been milled, returns them \$7 per pound, and they estimate the value of the balance at from \$7 to \$10 per pound. The richest of the ore appears in half-inch streaks, a number of which run through the pay streak proper, which is at present 20 inches in width. The ore in the small streaks appears to be almost pure tellurium, some sylvanite being noticeable. The work of stopping was commenced immediately upon the chimney being struck, and two men can take out about 12 pounds of the richest ore in a day, besides a good deal of second-class that will run in the neighborhood of \$500 per ton, and a third-class that assays from \$40 to \$100 per ton. Of the second-class they have about half a ton on hand and expect to make it a ton so as to ship it before the week is out.

The lower tunnel is estimated to be within 20 to 30 feet of the same chimney, and the probability that it is near at hand is strengthened by the widening of the vein that has been noticeable for the last 10 feet, and should it prove as anticipated there will be 140 feet of stopping in the perpendicular before the upper tunnel is reached. In addition to the openings mentioned, a 75-foot shaft has been sunk on a parallel vein that is about 12 feet distant. The investment has been upwards of \$3,500, the whole of which is likely to come back to the owners in a short time. The walls of the upper tunnel are five feet apart all the way in, and the lowest tunnel averages three feet. The walls are slick and clean and the vein is a true fissure. Messrs Walton and White are working the vein alone and will continue to do so until it is sufficiently opened up to work a larger force to good advantage. They know they have got a good thing and having worked long and well propose to reap the benefits of it.

**THE NORTH CALHOUN MINE.**—This mine, formerly the Woodchopper, says the *Carson Tribune*, is situated on the east side of the Carson river, and about one mile from the Mexican dam. It is now under the control of Senator Schultz, W. Krauss, Thomas Gallagher and F. Price, all of Storey county. The ore is termed base metal, and contains, beside galena a large amount of silver. The company have erected a battery which will be in operation in a few days. After crushing the ore they will concentrate the metal and send it to California for final reduction. There are 200 tons of ore ready for working, and from present appearances it seems inexhaustible. The ledge at the bottom of the incline is 12 feet wide. Our readers will recognize the fact that the mine in question is only four miles from Carson City, and therefore in the Eagle Valley mining district.

### A Complete Mill.

The Walker Brothers' mill was finished and steam was turned on the early part of last week to test the machinery and running gear. Everything was found to work to a charm, but owing to the want of battery screens, the work of crushing did not commence until last Saturday, when the bills echoed for the first time to the thunder of these stamps, and all the patriotic bunting of the village was spread to the breeze in honor of the starting of the first mill in Walker-ville.

Ground was broken for the foundation of this mill on the 17th of last July, so it was just three months and two days from the turning of the first sod until the whistle summoned all hands to duty, and 15 more stamps were set to work to test and develop the mineral resources of Butte.

The mill consists of three compartments: First, the ore room, into which the ore is delivered from the mine; next the main or battery building, comprising the drying kiln and battery room; and finally, the pan and settler compartment. In addition to these, there is a boiler and engine room 28x28 feet, and also a retort room 24x28 feet.

The power for working the battery, pans and settlers is furnished by a smoothly running engine of 75-horse power. The main driving shaft, running under the pan room, is 38 feet in length, and upon it there are 11 belt wheels. The capacity of the mill upon the ore at present being worked is 20 tons per 24 hours. The above is a brief description of what an experienced mill man pronounces "the most complete and best constructed mill in the entire West." It was built under the immediate supervision of Lathrop Dunn, the present Superintendent, assisted by Edward Reimal, formerly partner of Daniel Bell, the famous mill builder of Utah, and by Julian Smith.—*Butte Miner*.

**JAPANESE MIRRORS.**—Repairing of mirrors is a process to which the art of Europeans and Americans has not yet arrived. As they make mirrors in Japan, however, the process of repairing is no more difficult than that of mending a stove. The Japanese mirror would seem to be only an improvement on that used by Helen of Troy—a metallic affair burnished and polished. It is a bronze disk, composed of 80 parts copper, 15 of tin and five of lead. It is cast in a mold composed of powdered stone and pulverized crucibles. The casting is polished by hand as the Japanese alone can polish; and the last process is to rub the surface of the mirror with an amalgam composed of quicksilver, tin and lead. And this is done by hand and with a piece of wash leather, till the mirror has a bright, reflecting surface. This surface solves the problem of repairing some mirrors, since it can at any time be repolished. At every stage of the work the choicest materials are employed. The cheaper mirrors have sulphide of lead and antimony instead of tin, in their composition. A curious optical effect can be produced by some of these mirrors—probably the best finished. On the reverse, which is also polished, are words and figures in relief. By throwing in a bright light the reflection of the mirror on a screen, these figures are seen to shine through the reflected surface of the mirror. The fact is noted by an English professor in the University of Tokio, R. W. Atkinson. He has been able to discover no satisfactory solution of the phenomenon, but it is certainly worth investigation. The body of the mirror is absolutely opaque, and there must be some law of refraction not yet fully discovered to account for an appearance so singular.

**THE ABUSE OF SAWS.**—The *Northwestern Lumberman*, in an article on the abuse of saws, says: Makers are annoyed by having saws returned for repair in such a condition that it is impossible they should go through the wood, from the miserable way in which they have been filed and set—some jammed all to pieces, some not half filed, some not filed true on the face or back while others are all shapes but the right one in the throat, leaving no chamber room for dust and chips. Some saws have a bad pitch, some no pitch at all; some out of round; some with irregular or long and short teeth, one up and one down. In many cases they are returned broken. Why? Each tooth of a 24-inch circular saw goes through the wood 2,000 times per minute, 120,000 per hour, 1,200,000 times per day, and if not sharp, the saw is strained at the root of the tooth thus often, which frequently not only closes the set, but must eventually break the saw, for although steel is strong, continual straining will make it tender, and it must break. The tooth becomes dull on the side or under the point in proportion to the amount of feed; thus, if the tooth takes one-eighth inch bold at each revolution, it will become dull for one-eighth inch below the point, or more if the feed be greater. A diamond will not cut if dull; why should a saw? A few minutes' filing two or three times a day would save tenfold the amount of time and labor expended in running an imperfect, dull saw, also making a saving in the amount of power consumed; and a heavy percentage in the amount and quality of lumber cut. It is a mistaken idea that there is a saving by not taking time to sharpen a saw.

A DISPATCH from London, October 29th says, that on Saturday there arrived from Australia, India and China £531,000 of gold; most of which it is expected will go into the Bank of England.



**Heroines of the Hour.**

Noyon's heroine is a servant girl. A common sewer of great depth, says the New York *Tribune*, had been opened for repairs, and four men, passing that way in the dark, fell in. It was not until midnight that their perilous situation became known. The poor wretches were already suffocated from poisonous vapor; their moanings were heard, and their wives and children, frantic with grief, besought the bystanders for aid; but among all the stalwart men who gathered around the hole there was not one brave enough to go down and rescue his fellow-creatures. Then it was that Catherine Vasseur, a lass of 17, volunteered to descend into the pit, where she fastened a rope around two of the men, and, assisted by those above, she had the happiness of restoring them to their wives and children. Again she descended, and fastened a rope around the body of a third man, but her breath began to fail her. Fainting from foul air and exhaustion, she had sufficient presence of mind to knot the end with her own luxuriant tresses, so that when the dastardly fellows above drew the man to the surface they found the all but inanimate body of the young girl swinging by her hair to the end of the rope. Fresh air and stimulants restored her to consciousness, but not in time to save the fourth man, who perished in the pit.

A correspondent writing from Kuruh Dara, Turkish Armenia, in describing the battle at Kizil Tepe, says: It is currently reported to-day about the camp that one of the attacking columns of cavalry was under the command of a woman named Fatma, a daughter of an Arab sheik. A woman on horseback was seen at the front of the Circassian cavalry line when the first dash was made, after the pickets had been passed by means of the watchword, given in perfect Russian. It is stated by one of the few survivors whom I conversed with that this woman appeared utterly fearless of death, and that she rode across the line of her own troops when they were firing, in utter disregard of the usages of warfare and in evident ignorance of the absurdity of her conduct. She may have seen a picture representing Joan of Arc leading her troops. The poor, brave girl was killed before her men reached the Russian camp, indeed before the retreat became precipitous. She was seen to fall from her horse, and her whole troop of cavalymen, doubtless unable to restrain their steeds, passed over her quivering body. May she go straight to the harem of Mohammed in paradise.

**REALITIES.**—There is life and death going on in everything; truth and lies are always at battle. Pleasure is always warring against self-restraint. Doubt is always crying pshaw! and sneering. A man in life, a humorist in writing about life, sways over to one principle or the other, and laughs with reverence for right and the love of truth in his heart, or laughs at these from the other side. Didn't I tell you that dancing was a serious business to a harlequin? I have read two or three of Congreve's plays over before speaking of him; and my feelings were rather like those, which I dare say most of us have had, at Pompeii, looking at Sallust's bouse and the relics of an orgy—a dried wine-jar or two, a charred supper table, the breast of a dancing-girl pressed against the ashes, the laughing skull of a jester, a perfect stillness round about, as the Cicero twangs his moral, and the blue sky shines calmly over the ruin. The Congreve muse is dead, and her song choked in time's ashes. We gaze at the skeleton, and wonder at the life which once revelled in its mad veins. We take the skull up, and muse over the frolic and darings, the wit, scorn, passion, hope, desire, with which that empty bowl once fermented. We think of the glances that allured, the tears that melted, of the bright eyes that shone in those vacant sockets; and of lips whispering love, and cheeks dimpling with smiles, that once covered up ghastly yellow frame-work. They used to call those teeth pearls once. See! there's the cap she drank from, the gold chain she wore on her neck, the vase which held the *rouge* for her cheeks, her looking-glass, and the harp she used to dance to. Instead of a feast, we find a gravestone; and in place of a mistress, a few bones!—*Thackeray*.

**RUSSIAN SOLDIERS AND THE BIBLE.**—Among the strange incidents of the war in the East is the eagerness the Russian soldiers show for the purchase of Bibles sent for their use by the British and Foreign Bible Society. Over 60,000 Bibles have been bought by them since the Russian armies crossed the Pruth. An agent says that the readiness of the soldiers to buy is unparalleled in the experience of the society's continental work. It is a strange thing, he says, when fierce-looking Cossacks, armed to the teeth, thank you ten times over for having brought them the New Testament, and when they can scarce be restrained, in the gladness of their hearts, from taking you up in their bony arms to give you a well-meant hug of gratitude. And not only do the men buy, but they also read. The Russian soldier, he says, has yet to be discovered who would speak an irreverent word of the Holy Gospel. The commanding officer has frequently been the first to buy a number of copies, which he himself would distribute at once as a gift to the common soldiers around him.

**USEFUL INFORMATION.**

**Guarding the Snow Sheds.**

Now that winter is approaching, and the Sierras will soon don their caps of snow it is interesting to read of the renewed precautions which the Central Pacific Company have adopted to protect the snow sheds and those who pass through them. Lyman Bridges, a well known engineer, writes to the *Railway Age* as follows:

More than 40 miles of the road in the mountains is covered by snow sheds, and their liability to destruction by fire and snow slides renders special care necessary on that part of the line. Watchmen are required to go over the line in advance of all passenger trains. District electric signals are set up at regular intervals and used by these watchmen and all other guards to report their whereabouts, and any accident that may occur to the road-bed, tracks, sheds or trains. The method of working these signals is so simple that any intelligent laborer can use them, and yet they make known just the kind of accident that has occurred with unfailing accuracy. The watchmen have stated times to report and if a report is not sent in at the time appointed a guard is sent from the nearest station with all possible dispatch to learn why the signal was not given. If the watchman is found neglecting his duty he is either punished by suspension or is discharged, and debarred from being again employed by the company in any department. The time the watchmen are on duty is so short, and their districts are so small, as to guarantee that the men will be fresh for their work at all times. The watchmen are never required to be on duty longer than 12 hours. The district signals are also used as fire signals, and telegraph that a train is off the track, or a land or snow slide has occurred; that wrecking cars and crews are needed, or that trackmen are wanted; in fact, they can send messages covering all emergencies. Detonating signals are frequently used as danger signals, besides the ordinary red flags; in places very obscure additional watchmen are placed. At all bridges crossing running streams watchmen are placed, day and night; and electric signals are being prepared so that these men can call to their aid fire trains or wrecking cars with powerful blocks and tackle, boat hooks and any needed mechanical contrivance for protection from fire or freshet. From a high peak—Read mountain—north of the railroad, in the Sierras, a view of the snow sheds can be had along 18 miles of road. On this peak a lookout station is located during the summer, which is connected by a telegraph line with the road. The operators are furnished with powerful telescopes, and it is their duty to report any signs of fire in the sheds or in their vicinity.

Fire trains are kept at Truckee, Summit, Blue Canyon and Rocklin. The switch engines have fire pumps attached, and there are always 20 tons of water on cars, ready for them to attach to and start on their way to a fire at a moment's notice.

**CURIOUS MARKS OF ADMIXTURE IN WOOLS.**—In a letter addressed to the editor of the *Journal de l'Agriculture*, M. Viret calls attention to an apparently simple method of detecting the admixture of inferior wools with fleeces purporting to be of superior quality. It appears to be a common practice among a certain class of dealers to mix German wools with Australian goods of only half the value, and Spanish fleeces are similarly deteriorated by the addition of inferior Morocco wool. These are the most prevalent "tricks of the trade," but there are others in abundance. In certain cases the identification of a wool is easy, Russian and Buenos Ayres goods, for example, being readily distinguished from all others by the presence in the fleece of wild oats, in the one instance, and of a peculiar variety of small thistle in the other. But in German, Spanish, Australian and Morocco wools no such test is applicable. To distinguish between these M. Viret recommends us to have recourse to entomology. The fleeces from each of these countries will be found to contain coleopterous insects peculiar to it, and by an examination of these the real source of a wool in fleece may be indisputably determined, by whatever name a dishonest stapler may have placed it on the market. M. Viret adds that the credit for this suggestion is due to M. A. Levotviriou, of Elbert, who introduced it to the notice of the Entomological Society of France several years ago.

**WAXED PAPER.**—Waxed paper says the *Druggist Advertiser*, is made by saturating a well-made paper with beeswax. This may be done by the aid of a heated iron as in spreading plasters, or a solution of the wax in temperature may be spread on the paper with a brush. On the small scale, a piece of the paper to be waxed should be spread over a heated flat iron, and by passing a piece of a beeswax rapidly over the surface of it, sufficient wax will be absorbed by the paper. If properly prepared this paper will answer all the purposes for which tinfoil is generally used.

**Post Office Dangers.**

In postal matters some common expedients supposed to secure safety have the opposite effect. Speaking of the new envelopes made of paper and linen, Mr. Jeffery, of the London post office, who gives his opinion with all the weight of the manager of the department of lost letters, says: "Their very strength is their weakness, because if you put a paper knife in the folds of an envelope, it will lift it up without tearing, and may be closed again without any traces of the violation. This can be done wherever linen comes to linen, or where linen comes to paper. But where paper comes to paper, you cannot separate the parts without tearing and leaving the marks behind. It must be remembered, too, that the post office servants acquire marvelous expertness in determining by touch whether a letter contains bank notes or stamps; if they cannot get the knowledge by their fingers, felonious postmen can smell the stamps." A striking experiment on this subject was made by Mr. Jeffery. He made up 20 letters, only five of which contained stamps, and all of which were alike on the outside. An experienced post office servant was able to pick out, by the sense of smell, those with the stamps. The only device which baffled him was to scent the letters with *eau de cologne*. Of course mothers will continue to send currency to their boys at school by post, and the mass of mankind will insist upon remitting small sums in the form of stamps in spite of remonstrances and warnings. But it is right that they should know, from the testimony of experienced officials, that the employees of the post office become expert in the feeling of letters; that they can tell very correctly whether letters contain bank notes, coin or stamps; that they have, in fact, as keen a perception of valuable letters as an American post office clerk has of interesting English illustrated periodicals; and that, if stamp remittances are not frequently stolen, it is because they rarely are worth stealing.

**THE FRENCH BEET SUGAR INDUSTRY.**—The *Journal Officiel* of September 12th publishes a statement of the production and movement of home grown sugars from the commencement of the season up to the end of August. This document still further endorses the adverse reports which have appeared from time to time. The quantity of juice treated within the period named was 46,788,000 hectoliters, and the total production of sugar amounted to 280,307,544 kilogrammes, or 214,296,000 kilogrammes less than in the previous season. On August 31st the stock on hand in all the factories combined was only 6,388,693 kilogrammes of finished sugar, and 5,914,095 kilogrammes in course of manufacture. It is added that, besides the general reduction of production, the depreciation of the beet in saccharine value is this year particularly marked. In some districts the harvesting of this year's roots has commenced, and, so far as can be at present judged, the results are but indifferently good.

**GOOD HEALTH.**

**Economy in Foods.**

In times when the most rigid economy is often necessary to sustain life and provide comforts, it is essential to know how the questions of price and real nutriment in different foods compare. Our readers are often assured that the highest priced meats and vegetables are not the most nutritious, and it is time that all false notions about obtaining nothing but "first cuts" at the butcher's were done away with. We obtain through the London *Farmer* an interesting article by Dr. J. Konig, in which he sets out the nutritive value of many common articles of diet as determined by analysis, and compares this with the average price paid for such articles in the ordinary way. The comparison reveals some startling contrasts between the cost of many dishes and their nutritive value as food. As his standard of comparison, Dr. Konig first of all determined the value of a kilogramme of protein, fat, and hydrocarbons, taking pure hogs' lard and beef of good quality as representative of animal foods, and rye-meal and potatoes of vegetable substances. As a result he found the value per kilogramme as follows:

In animal foods.	In vegetable foods.
Albumen.....6.5 marks	1.50 marks
Fat.....2.0 "	0.45 "
Non-nitrogenous extractive matter.....—	0.25 "

He then proceeded to analyze a large number of different animal and vegetable foods, and arranged the results obtained in a tabular form, showing their comparative nutritive values as calculated on this basis. The prices of the various foods are appended in a parallel column, and thus a comparison can readily be drawn between the money value and the nutritive value of each article in the list. It is hardly necessary to point out that the selling prices in other localities may differ widely from those adopted by Dr. Konig as ruling in his immediate neighborhood, but the necessary correction for such discrepancies can be readily made, and the comparison between value as food and value as merchandise still easily drawn.

In the table below the values are calculated

in pfenningings, or tenths of a penny;

I.—Animal Food.

Description.	Nutritive Value.	Market Price.
Beef from medium ox, prime cuts.....	136.3	100
Second-class cuts.....	143.9	144
Third-class cuts.....	132.3	86
Beef kidneys.....	112.5	100
Beef from choice ox, prime cuts.....	132.9	166
Second-class cuts.....	174.2	165
Third-class cuts.....	101.0	100
Beef, lean cuts.....	157.6	172
Beef liver.....	133.4	50
Breast of veal, from choice calf.....	154.4	174
Leg.....	141.2	198
Heart.....	121.8	60
Lung.....	110.8	30
Ham of half-fat pig.....	172.1	160
Ribs.....	172.1	182
Head.....	161.9	170
Liver.....	137.3	110
Hare.....	143.4	221
Partridges.....	167.2	573
Feldgates.....	255.0	600
Herrings.....	156.0	105
Sardines.....	149.3	405
Salmon.....	102.4	500
Caviare.....	235.0	600
Smoked meat.....	206.8	320
Smoked ham.....	223.8	300
Bologna sausage.....	102.4	400
Black pudding.....	70.4	60
Liver sausage, 1st quality.....	117.9	140
Liver sausage, 2nd quality.....	104.3	106
Lard.....	189.5	180
Hens' Eggs.....	100.0	206-240
Milk.....	33.6	15
Butter.....	170.0	200-210
Cheese.....	223.5	150-200

II.—Vegetable Foods.

Description.	Nutritive Value.	Market Price.
Rye-meal, fine.....	33.2	30
Rye-meal, coarse.....	37.9	24
Wheat flour, 1st quality.....	31.2	44
Wheat flour, 2nd quality.....	35.2	40
Buckwheat groats.....	32.9	72
Oatmeal.....	36.6	80
Rice.....	30.0	30
Hulled barley.....	30.0	30
Rye-bread, black.....	21.3	20
Rye-bread, fine.....	23.1	33
Wheat bread, fine.....	28.9	48
Peas.....	48.7	30
Potatoes.....	8.4	6
Carrots.....	2.8	33
Cabbage.....	4.7	12
Spinach.....	7.0	22
White-heart Cabbage.....	3.9	10
Cauliflower.....	5.2	320
Asparagus.....	3.9	150
Beans, fresh.....	12.3	38
Chocolate, sweetened.....	32.8	215

Incomplete as these figures necessarily are, as here curtailed, they nevertheless point to some facts of interest and importance to housekeepers. They show that meat from the several parts of a carcass has a very different composition, a fact, however, that has long been ascertained from other investigations. While the percentage of animal albumen varies but little, the proportions of water and fat differ widely, that of fat increasing as that of water diminishes. Hence the fat parts of a carcass are proportionately more valuable as food. The figures further show how little connection there is between price and value as food of the different articles examined. Varieties of food obtained from meat, either as smoked flesh or in the form of sausage, are much dearer in proportion than the fresh natural meat, costing more money and having a lower nutritive value. Milk and cheese are shown to be very cheap forms of food, and even the high price of butter is not greatly disproportionate to its nutritive value. As regards vegetable food, potatoes head the list as having a nutritive value more than equivalent to their price. Rye and wheat, again, are proportionately much cheaper than other cereals, and than buckwheat. The dearest forms of food of all, comparatively speaking, are table vegetables. Some of them are only to be regarded as expensive luxuries, judged as feeding material. Tea, chocolate and coffee have no appreciable nutritive value, and for practical purposes must be regarded as luxuries or delicacies only.

**BURNING GARBAGE.**—New York city has begun experiments with cremation of garbage thinking thus to better guard the city's health. The furnace to be used, in case the city enters into a contract for the cremation of all the garbage collected, will be 13 feet in diameter, 16 feet high, with a capacity of burning 1,000 loads of garbage and ashes in 24 hours. There will be six furnaces in different parts of the city, convenient for the garbage carts. During the three weeks the Seventh Ward contract has been in force, 300 loads of garbage have been consumed, and the opinion of those who live in the vicinity of the furnace, is that no unpleasant odor is emitted. The garbage, just as dumped, is shoveled into a furnace with large fires and a heavy blast beneath. Seventy-two loads a day are thus disposed of, and the entire work is performed by four laborers and an engineer. The gases evolved are passed into the boilers, and all unpleasant odors are consumed. Col. Foote, states that he has been informed by the Police Commissioners that it costs the city \$500 a day to tow out and dump 3,500 loads of garbage into the sea, and Mr. Foote believes, if the city undertake the cremation plan, the product will sell for enough to pay for the expense of the furnace. He states that he has been offered 20 cents a load for all the product he can deliver.

**A HOMEOPATHIC JOURNAL.**—As a matter of news to those of our readers who are of the homeopathic faith, we would state that we have been interested in perusing a copy of the *California Medical Times*, a quarterly journal of medical, surgical and sanitary science. It is edited by Drs. F. Hiller, Jr. and Sidney Worth, at 226 Post street, S. F. The magazine has a vigorous tone and doubtless will be welcomed by the homeopathic interest throughout the coast.



# MINING SCIENTIFIC PRESS

W. B. EWER, SENIOR EDITOR.

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Address all letters to the firm, and not to individual members, or others, who may at any time be absent.

Our latest forms go to press on Thursday evening.

SAN FRANCISCO:

Saturday Morning, Nov. 10, 1877.

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## The Week.

The recent rains have dispelled any linger-  
ing fears of another dry winter and already  
a revival of business is noted. The hy-  
draulic miners throughout the State will soon be  
actively at work again, and the springs and  
rivers, as they commence to rise will start up  
many idle quartz mills. The principal item of  
interest in connection with mining matters this  
week has been the reported strike in the 1900-  
foot level of the Ophir mine, and the refusal of  
the Superintendent to allow an inspection of the  
mine by stockholders. There seems to be  
some mystery in connection with the matter  
which is not yet cleared up.

The Committee of Comstock mining superin-  
tendents appointed to inquire into the cost of  
pumping water, and to investigate other points  
connected with the Sutor tunnel question, held  
a meeting at the Chollar-Potosi office on Tues-  
day. There were present Superintendents Fair,  
Smith, Mackay, Requa, Patton, Schultz, For-  
man, Osbiston, Strother, Hardy, Gillette and  
Shepherd. The reports of the various superin-  
tendents were received and discussed. A *News*  
reporter interviewed Mr. Requa, chairman of  
the committee, and learned that it had been  
resolved not to make anything public until the  
report of the committee is submitted to the  
mine managers in San Francisco. Messrs.  
Requa and Patton were deputed to carry the  
report to San Francisco. They arrived here on  
Thursday night. As soon as the report is made  
public we will publish it.]

## Timber on Mineral Lands.

The bill introduced in Congress by Ex-Gov-  
ernor Pacheco, of this State, for the sale of  
timber land, exempts from its operations all  
lands containing minerals, and all settlers' im-  
provements. It also reserves all bona fide rights  
already attached under United States laws, and  
in regard to lands hereafter to be surveyed,  
gives actual occupants prior opportunities for  
purchase before offering lands for public sale.  
Each applicant for purchasing any quarter sec-  
tion already surveyed is required to make oath  
of his bona fide intention to appropriate the  
same for his own use, and not for sale, and that  
he has made no other application, and has not  
agreed in any way to transfer the title. Pacheco  
says he is not committed to every detail of the  
bill, and will ask its very careful consideration  
at the hands of the Public Lands Committee,  
of which he is a member.

The Government practically permits miners  
to cut timber on the public lands for mining  
purposes. On the even sections they cut as  
much as they see fit, and it is only when there  
is wanton waste that they are arrested. Most  
of this land, however, is now taken up by pri-  
vate parties. Manufacturers of lumber for  
mining purposes have bought up large tracts,  
and in most cases the miners now buy their  
timber. On the odd sections, or railroad lands,  
the miners have also been in the habit of cut-  
ting timber, although the Central Pacific Com-  
pany have brought several suits to prevent it.  
Mineral lands do not pass to the Central Pacific  
railroad by virtue of its grant, but the timber  
being or growing on mineral land, within ten  
miles of the center line of the road or its  
branches, was granted to said company, except  
so much as is necessary to support the improve-  
ments of mine owners upon the given tracts.  
The question is, how much is necessary? and in  
a number of instances suits have been brought.  
When patent issues for such mineral land, it is  
necessary to insert therein a clause excepting  
from the operation of the patent all timber  
being or growing upon odd-numbered sections  
within the limits referred to, except such "as is  
necessary to support his improvements as a  
miner."

However, the miners will continue to cut  
what timber is necessary for their business on  
either odd or even sections belonging to Govern-  
ment or railroad unless stopped by legal mea-  
sures. It is only high up in the mountains that  
much of this land is left, nearly all the rest  
having been purchased. Manufacturers of  
timber have bought from the railroad their  
rights in odd sections, and, of course, in such  
cases, they prevent the miners, as far as possi-  
ble, from cutting any timber at all.

The Commissioner of the General Land Office  
in his annual report, just filed, recommends  
that Congress withdraw all lands chiefly valu-  
able for pine timber from the operation of the  
homestead and pre-emption laws, and also from  
sale, except for cash; also that the Secretary of  
the interior be authorized to sell timber from  
the public lands in mining districts; also, to  
sell timber upon any unsurveyed land, not min-  
eral, when needed for actual settlement before  
public surveys; also, that a law be enacted pro-  
viding for the care and custody of timber lands  
unfit for agricultural purposes, and for the grad-  
ual sale, and for perpetuating the growth of  
timber on such lands. Legislation authorizing  
seizures of timber cut from public lands, with-  
out resort to the tedious processes of the courts,  
is also recommended.

## The Legislature and the Mines.

The State Legislature will convene at Sacra-  
mento in a short time and if our mining friends  
have any suggestions to make to the members  
they can commence putting on their thinking  
caps and prepare their arguments. The Legis-  
lature itself cannot make any changes in the  
mining laws, but can memorialize Congress on  
the subject. It can, however, take cognizance  
of stock gambling, and endeavor to remedy  
some of the evils connected with it. Perhaps  
the Palace Hotel Reform Committee, which was  
to make a great change in the methods of deal-  
ing in stocks, but has done nothing as yet, may  
have a chance to come forward with some valu-  
able suggestions for reform. Still, as they have  
not done so, those of our readers who have had  
any experience on the subject can ventilate  
their views in the *PRESS*. Our columns are  
open to the discussion of all subjects of this  
character.

Our legislative friends who are desirous of  
really benefiting the mining interests, can see  
what the working miners think by reading the  
*PRESS*. If they have little or no knowledge of the  
subject, they can speedily post themselves by a  
perusal of our columns from week to week, and  
in case any controversy affecting the miners is  
carried on, they may be able to judge of its  
merits by reading the discussions carried on by  
those interested. Several questions of vital  
importance will come up at the present session  
of the Legislature, and the members owe it to  
themselves and to their constituents to thor-  
oughly understand the matters in all their bear-  
ings before casting their votes. We shall en-  
deavor, as far as lies in our power, to throw  
what light we can on these subjects, and are  
anxious that our readers should contribute as  
far as possible to the same end.

Hayden's Survey and the Archeology of  
the Southwest.

Up to the year 1874 rumor had been telling  
many marvelous stories of strange and interest-  
ing habitations of a forgotten people who once  
occupied the country about the headwaters of  
the Rio San Juan, but these narrations were so  
interwoven with romance that but few people  
placed much reliance upon them. To those well  
versed in archeology, ruins of an extensive and  
interesting character were known to exist  
throughout New Mexico and Arizona, and the  
various reports of Albert Johnson, Sitgreaves,  
Simpson, Whipple, Newberry and others, forms  
a most interesting chapter in ancient American  
history; but their researches, aside from the  
meager accounts published by Newberry, threw  
no light on the marvelous cliff dwellings and  
towns north of the San Juan.

In 1874 the photographic division of the  
United States Geological Survey was instructed,  
in connection with its regular work, to visit  
and report upon these ruins, and in pursuance  
of this object made a hasty tour of the region  
about the Mesa Verde and the Sierra El Late in  
southwestern Colorado, the results of which trip,  
as expressed by Bancroft in the "Native Races of  
the Pacific Coast": "Although made known to  
the world only through a three or four day's  
exploration by a party of three men, are of  
the greatest importance." A report was made  
and published with 14 illustrations in the Bulle-  
tin of the United States Geological and Geo-  
graphical Survey of the Territories, Second  
Series No. 1, and some of the engravings were  
recently reproduced in our columns.

The following year the same region was vis-  
ited by Mr. W. H. Holmes, one of the geolo-  
gists of the Hayden survey, and a careful in-  
vestigation made of all the ruins. Mr. Jackson,  
who had made the report the previous year,  
also revisited this locality, and extended his ex-  
plorations down the San Juan to the mouth of  
the DeChelly, and thence to the Moqui villages  
in northeastern Arizona. Returning, the  
country between the Sierra Ahajo and La Sal,  
and the La Plata was traversed, and an immense  
number of very interesting ruins were first  
brought to the attention of the outside world  
by the report which was published the follow-  
ing winter by Messrs. Holmes and Jackson in  
the Bulletin of the United States Geological and  
Geographical Survey of the Territories, vol. ii.  
No. 1.

The occasion of the Centennial exhibition at  
Philadelphia, led to the idea of preparing  
models of these ruins, for the clearer illustra-  
tion of their peculiarities, four of which were  
completed in season for the opening of the ex-  
hibition. The first was made by Mr. Holmes  
with whom the idea originated, and represents  
the "Cliff house of the Mancos canyon," the  
exterior dimensions of which are 28 inches in  
breadth by 46 inches in height, and the scale  
1 to 24; or two feet to the inch. This is a two-  
story building constructed of stone, occupying  
a narrow ledge in the vertical face of the bluff,  
700 feet above the valley, and 200 feet from the  
top. It is 24 feet in length and 14 feet in depth,  
divided into four rooms on the ground floor.  
The beams supporting the second floor are all  
destroyed. The doorways, serving also as win-  
dows, were quite small, only one small aperture  
in the outer wall facing the valley. The ex-  
posed walls were lightly plastered over with  
clay and so closely resembled the general sur-  
face of the bluff that it becomes exceedingly  
difficult to distinguish them at a little distance  
from their surroundings.

The second model of this series was con-  
structed by Mr. Jackson, and represents the  
large "Cave town in the valley of the Rio de  
Chelly," near its junction with the San Juan.  
This town is located upon a narrow bench occur-  
ing about 80 feet above the base of a perpendic-  
ular bluff some 300 feet in height. It is 545 feet  
in length, about 40 feet at its greatest depth,  
and shows about 75 apartments on its ground  
plan. The left hand third of the town, as we  
face it, is overhung some distance by the bluff,  
protecting the buildings beneath much more  
perfectly than the others. This is the portion  
represented by the model. A three-story tower  
forms the central feature; upon either side are  
rows of lesser buildings, built one above another  
upon the sloping floor of rock. Nearly all these  
buildings are in a fair state of preservation.  
This model is 37 by 47 inches, outside measure-  
ment, and the scale 1 to 72, or six feet to the  
inch.

A "Restoration" of the above forms the third  
in the series—of the same size and scale—and is  
intended, as its name implies, to represent as  
nearly as possible the original condition of the  
ruin. In this we see that the approaches were  
made by ladders and steps hewn in the rock,  
and that the roof of one tier of rooms served as  
a terrace for those back of them, showing a  
similarity, at least in their construction, to the  
works of the Pueblos in New Mexico and  
Arizona. Scattered about over the buildings  
are miniature representations of the people at  
their various occupations, with pottery and  
other domestic utensils.

The "Triple-Walled Tower," at the head of  
the McElmo, is the subject of the fourth model.  
It was constructed by Mr. Holmes and repre-  
sents, as indicated by its title, a triple-walled

tower, situated in the midst of a considerable  
extent of lesser ruins, probably of dwellings,  
occupying a low bench bordering the dry-wash  
of the McElmo. The tower is 42 feet in diameter,  
the wall two-feet thick, and now standing some  
12 feet high. The two outer walls enclose a  
space of six feet in width, which is divided  
into 14 equally sized rooms, communicating  
with one another by small window-like door-  
ways. The above are all that were exhibited at  
Philadelphia; since then others have been made  
by Mr. Jackson, as follows:

"A Cliff House in the valley of the Rio de  
Chelly." It is about 20 miles above the cave  
town already spoken of. This is a two-story  
house, about 20 feet square, occupying a ledge  
some 75 feet above the valley and overhung by  
the bluff. The approach from the valley is by  
a series of steps hewn in the steep face of the  
rock, and this method was the one most used  
by the occupants, although there is a way out  
to the top of the bluff. This model is 42 inches  
in height by 24 broad, and is built upon a scale  
of 1 to 36.

"Tiwa," one of the seven Moqui towns in  
northeastern Arizona, is a very interesting and  
instructive model, representing as it does one of  
the most ancient and best authenticated of the  
dwellings of a people who are supposed to be the  
descendants of the cliff dwellers. Tiwa is the  
first of the seven villages forming the province,  
as we approach them from the east, and occu-  
pies the summit of a narrow mesa some 600 feet  
in height and 1,200 yards in length, upon which  
are also two other somewhat similar villages.  
The approach is by a circuitous roadway hewn  
in the perpendicular face of the bluff, which  
surrounds the mesa on all sides; it is the only  
approach accessible for animals to the three  
villages. Other ladder-like stairways are cut  
in the rock, which are used principally by the  
water carriers, for all their springs and reser-  
voirs are at the bottom of the mesa. This vil-  
lage is represented upon a scale of one inch to  
eight feet or 1 to 96. The dimensions of the  
model are 36 inches in length, 29 inches in  
width and 14 inches high.

In the spring of 1877 Mr. Jackson made a  
tour over much of the northern part of New  
Mexico and westward to the Moqui towns in  
Arizona, and secured materials for a number of  
very interesting models, illustrating the meth-  
ods of the Pueblos or Town Builders in the con-  
struction of their dwellings. Two villages have  
been selected for immediate construction, as  
showing the most ancient and best known ex-  
amples of their peculiar architecture, viz.: Taos  
and Acoma, the one of many storied, terraced  
houses, and the other built high up on an im-  
penetrable rock.

The model of Taos is now completed, the  
dimensions of which are 42 by 39 inches, and  
the scale one inch to 20 feet. Of this town  
Davis says: "It is the best sample of the an-  
cient mode of building. Here are two large  
houses, 300 or 400 feet in length, and about 150  
feet wide at the base. They are situated upon  
opposite sides of a small creek, and in ancient  
times are said to have been connected with a  
bridge. They are five and six stories high, each  
story receding from the one below it, and thus  
forming a structure terraced from top to bottom.  
Each story is divided into numerous little com-  
partments, the outer tier of rooms being light-  
ed by small windows in the sides, while those  
in the interior of the building are dark and are  
principally used as store-rooms. The only  
means of entrance is through a trap door in the  
roof, and you ascend from story to story by  
means of ladders on the outside, which are  
drawn up at night."

Their contact with Europeans has modified  
somewhat their ancient style of buildings, prin-  
cipally in substituting doorways in the walls of  
their houses for those in the roof. Their mod-  
ern buildings are rarely over two stories in  
height, and are not distinguishable from those of  
their Mexican neighbors. The village is sur-  
rounded by an adobe wall, which is just includ-  
ed within the limits of the model, and incloses  
an area of 11 or 12 acres in extent. Within  
this limit are four of their *casufas*, or secret  
council houses. These are circular, under-  
ground apartments, with a narrow opening in  
the roof, surrounded by a palisade, ladders  
being used to go in and out.

These models are first carefully built up in  
clay, in which material all the detail is readily  
secured, and are then cast in plaster, a mold  
being secured by which they are readily multi-  
plied to any extent. They are then put in the  
hands of the artists and carefully colored in solid  
oil paints to accurately resemble their appear-  
ance in nature, and in the case of restorations,  
or modern buildings, all the little additions are  
made which will give the appearance of occu-  
pation.

The survey is in possession of the data for the  
construction of many more models, and they  
will be brought out as opportunity is given.  
They have also in connection with the ruins,  
multiplied many of the curious pieces of pot-  
tery which have been brought back from that  
region by the various parties connected with the  
survey.

MANY prominent dignitaries in Constanti-  
nople have been arrested by order of the Grand  
Vizier. It is said that a conspiracy on the part  
of a party of ex-Sultan Murad has been dis-  
covered.

OUR Oregon agent, Mr. E. M. Deuny, has  
been heard from at the Dalles, and we soon ex-  
pect some correspondence for the *PRESS* from  
our flourishing sister State.







## Copper Mines on Snake River.

Mr. Levi Allen, an early pioneer of this Territory, but latterly a resident of Helena, Montana Territory, called on us yesterday on his return trip from his copper mines on Snake river. These mines are located about halfway between Brown Lee's ferry and Pittsburg landing, and six miles back from Snake river. The first copper mine in this section was discovered by Mr. Allen in 1862. He came over with a large party from North Idaho, within 16 miles of Boise basin, two months before Grime's party discovered gold near Hogau, now Pioneer, in August, 1862. Mr. Allen's party was making for Boise basin, but the number of men in the party were too many, and they got up dissensions about the routes they were to take, and broke up. A small party went with Allen to prospect the country lying between the Salmon and Snake river. In their travels they struck this copper lead. Copper was not counted worth much in those days, but Allen was satisfied this was a true lead, very rich and inexhaustible. The following summer he came to Boise county, and lived in Boise city in 1864. Since that time he has been most of the time in Montana. He has made frequent visits to this mine and done the necessary work to hold it. He was back last spring and intended to do a good deal of work this summer, but the Nez Perce Indian war broke out so he left and went back to Montana.

There is considerable copper ore in that Territory, and such mines are counted safer than gold mines, while they are not looked after much in Idaho. On Mr. Allen's representations, several wealthy gentlemen of Helena made propositions to buy this mine, and Prof. Isaac R. Lewis, Superintendent of several mining companies in that Territory, came out with Mr. Allen to examine the mine and report, and they are now on their return home. The mine has been relocated under the United States laws, and consists of 1,500 feet in length, and 600 feet in width, and is called the Peacock copper mine. It is 120 feet wide, and there is a shaft down 40 feet. The ore as it is taken out runs from 40 to 85 per cent. in copper. Chunks or boulders of ore are found weighing several tons, which will yield 85 per cent. of pure copper. There are over 500 tons of ore that will yield 50 per cent. that can be packed up and sacked without any labor in extracting the ore. Prof. Lewis is well pleased with the mine, and says it is better than Mr. Allen represented it. If it is not sold on their return he will take an interest with Mr. Allen, and they will return in the spring and work from 75 to 100 men on the mine. They expect the outlet will be down Snake river; pack or haul the ore to Pittsburg landing, and then send it by boats down the Snake and Columbia rivers to Portland. Mr. Allen and Lewis located another copper lode three miles from the Peacock, which they think will prove rich, and have named it the White Monument. The base metal lead of Abernathy & Co. lies about 12 miles south of this place and the Heath silver district is 12 miles further south, all in the same range and belt of mineral country. Our personal knowledge of this section leads us to believe that extensive mining operations will soon be carried on in that region. —*Idaho Statesman.*

**THE FIRESIDE.**—The fireside is a seminary of infinite importance. It is important because it is universal, and because the education it bestows, being woven with the woof of childhood, gives form and color to the texture of life. There are few who can receive the honors of college, but all are graduates of the hearth. The learning of the university may fade from recollection, its classic lore may molder in the halls of memory; but the simple lessons of home, enameled upon the heart of childhood, defy the rust of years, and outlive the more mature but less vivid pictures of after days. So deep, so lasting, indeed, are the impressions of early life, that you often see a man in the imbecility of age holding fresh in his recollection the events of childhood, while all the wide space between that and the present hour is a blasted and forgotten waste. You have, perchance, seen an old and half-obliterated portrait, and in attempting to have it cleaned and restored, you may have seen it fade away, while a brighter and more perfect picture painted beneath is revealed to view. This portrait, first drawn upon the canvas, is no inapt illustration of youth; and though it may be concealed by some after design, still the original traits will shine through the outward picture, giving it tone while fresh, and surviving it in decay. Such is the fireside—the great institution furnished by Providence to educate men. —*Journal of Education.*

**ELEPHANTINE VOCALISM.**—A recent traveler states that the elephant emits four distinct sounds, each of which expresses a certain state of feeling or thought. The first is an acute and whistling cry, produced by a blast sent through the trunk; the animal thus shows his contentment. To indicate surprise or alarm he makes with his mouth, a noise which is like *pr-rut, pr-rut*. A sound like that of a trumpet, and given with force, indicates anger. When the elephant is furious, or when he rushes on an assailant, the sound changes to a hoarse hellow, or a terrible cry. The fourth sound denotes discontentment or distress; it is frequently repeated by the animal when separated from the rest of the herd, tired, famished, or too heavily loaded; it may be imitated by *urmph, urmph*.

## Bristol and Jackrabbit Districts.

The developments made in the Day mine have caused owners of mines in Bristol district to renew exertions in the development of mines owned by them, which mines had only been partially worked for some time past. All have commenced work in a systematic manner, the exertions made in that respect proving that there has lain dormant for some time a class of mining property that only needed a little work to prove it valuable.

In the Cave mine, owned by the Rowe Brothers, a development has shown that the vein carries a large amount of silver along with the copper, for which it has always been worked. The Richards' mine, of which A. J. Blair is part owner, is now being worked vigorously in consequence, and is making a good showing. The Sultan mine is also putting in goodicks, the owners thinking they have got a No. 1 mine. At the Mayflower work is being pushed night and day, ore being taken out rapidly and sacked. The body of ore is large and of good quality, as shown by the various assays of the same. Before long we will have a working of ore from this mine which will show to every one that the stockholders were not amiss in keeping up steady work on it. The Bay State, and other mines in Bristol district, we have learned nothing of lately.

In the Jackrabbit district the Day mine is still holding its own, besides getting 43 tons of first and second class ores worked at the Raymond & Ely mill. The work of running the tunnels still continues, about 25 men being employed day and night in placing the mine in good shape, and further developing it. The Junction mine, owned by Press, Wand, J. O. McCormick and others, have struck a body of ore, assays from which show over \$100 per ton, and improving as work continues. The owners think they have a good mine, and are sticking to it and pressing work ahead. The Senator mine, Drolette, Clymo and Lynch owners, are prosecuting work vigorously, and the mines are improving rapidly. There are numerous other mines in the Jackrabbit mining district which we could mention that are all making a fair showing for their owners, but we reserve them until further developments have been made.

The work being done and the developments being made show that these two districts will be of immense importance in mining circles before a great while. —*Pioche Record.*

**IRON SAILING SHIPS.**—The New York *Tribune* says that "up to last year only one iron sailing ship had been built in the United States. There were iron shipyards enough, and competent builders, and the builders were offering to construct vessels as cheap as they could be bought abroad, and as an illustration of what they could do in shipbuilding they have been producing some of the fleetest, staunchest, and most beautiful iron steamships which sail in and out of the ports of the United States, but no one ordered an American iron sailing ship. From various causes shipmasters were content with wood. There now begins to be an inquiry, however, concerning American iron ships. The state ment that such vessels can be built as cheaply in this country as abroad has attracted wide attention, and a prominent builder is now in receipt of letters from Boston and Liverpool, saying that if he can build iron sailing vessels at the rates claimed, the writers will certainly order ships from him. The rate in England for a first-class iron vessel of, say, 1,000 tons burden, with a double outfit of sails, is about £9 per ton, the offer is made to construct the same sort of ship precisely for \$45 a ton, in currency, and negotiations are now in progress in regard to the matter.

**EBERHARDT AND AURORA.**—*Eureka Sentinel* Oct. 28: We are in receipt of reliable information confirming the development in the Eberhardt and Aurora tunnel, in White Pine. The strike was made at a distance of 2,100 feet from the mouth of the tunnel. At latest accounts the whole face of the tunnel, which is 9x14 feet, was in good ore, assaying \$100 per ton. Great importance attaches to this discovery, as it establishes the depth and permanency of the mines of Treasure Hill beyond any reasonable doubt. We may now hope to see White Pine take on something of her former prosperity. The ores of that section are the richest and freest in the State, and the only question hitherto has been one of depth. The strike in the Eberhardt and Aurora tunnel settles that matter, and it is not improbable that hundreds of old White Piners will now hasten back to look after mines that have long remained idle.

**FORMATION OF CANNEL COAL.**—A discovery has been made in Australia which confirms with singular minuteness the theory that assigns to the cannel coal an origin from leaves. It is difficult to understand how leaves can accumulate free from dirt in sufficient quantity to form beds of cannel coal, now several feet thick, and representing their mass many times in leaves. But in Australia just such a mass of leaves have been found, partially but not completely altered to cannel. The appearance and fracture of fresh blocks are the same as of this kind of coal found elsewhere, but after several years exposure it can be separated into thin laminae, which shows that the mass is composed principally of leaves. The bed is six feet thick, and the government geologists call it "incipient lignite."

## Montana Mining Items.

The shaft on the Burlington is now down 115 feet. The crevice at that depth is three feet and a half wide, very clearly defined, and yields ore at least as high a grade as any ever taken from the lode. There is very little water, and the shaft is still going down.

The double whim on the western shaft of the Lexington is completed and has been in operation for something over a week. The shaft is an incline, having a pitch of 45° and the ore is hoisted in regular ore cars instead of clumsy buckets.

The Centennial mill will probably remain idle for some time. Mr. Howe is going to San Francisco and St. Louis to raise funds to enable him to run the mill.

The Green Campbell mill, at Silver Star, has changed hands. Its present owners are Messrs. Morris and Johnson, of Virginia City, and Col. W. F. Saunders, of Helena. The new owners have refitted and put in good order their mill by adding two new settlers and removing the four Horn pans formerly in use. The mill is now running on ore from the Broadway lode. The above-named gentlemen, together with Mr. F. R. Merk, own one-half the mine and Messrs. Dabler, Largey and others the other half—according to the late decision of the court. The mill has ten stamps and a capacity of from 12 to 15 tons of ore per day, and is well adapted for working gold ores. There are 500 tons of ore on the dump, with plenty more in sight, and when the two companies can agree upon a basis of working this valuable mine, their respective mills at Iron Rod and Silver Star can be kept running constantly, and at a fair profit to their owners, as the ore mills from \$12 to \$30 per ton. The Green Campbell started up on the 17th ult. —*Butte Miner.*

**NEW MOTOR.**—An improved motor, which depends for its action upon the well-known law of the increase of pressure of a fluid jet as its velocity is diminished, has been invented by Mr. R. Adams, of Coathbridge, England. The motor consists of a wheel or disc carried on a revolving shaft, and contained within a closed casing in which it is free to rotate. The wheel or disc is formed at its circumference with teeth, which are straight on one side and curved or inclined on the opposite side. At a point in the circumference of the casing between the interior of which and the circumference of the wheel there is a clear or free space, a nozzle of a small hose is situated longitudinally or approximately so, and this being in connection with a source of water supply at high pressure admits a small jet of water at the high velocity corresponding to the pressure to the interior of the casing. This jet of water after it escapes from the nozzle strikes (at a tangent or nearly so) the straight side of the teeth in the circumference of the wheel or disc, and its velocity becoming reduced it escapes by the outflow formed at an opposite point or other part of the casing. The inclined or curved side of the teeth in the wheel or disc enables it to rotate in the water with a minimum of retardation.

WOODWARD'S OARDENS has the following new attractions: The buffalo chase; large whale skeleton; new museum; improvements in the zoological department, besides the other features which have made it popular.

## HOW TO ADVERTISE.

The following views of some of our most successful business men, says an exchange, will be very generally concurred in:

"The laundry lithographs so freely used by certain manufacturers neither express good sense nor good taste; they suffer even by comparison with the comic valentine, for although the latter is essentially vulgar, and frequently a hurtful missile in the hands of a foolish or a malicious person, it means something; it has about it some touch of humor—it tells for what it was designed. But the stove manufacturers' valentine, I mean the red and yellow lithograph, has no redeeming qualities about it. At best, it but announces the thoughtlessness or want of dignity of its author; and if it does not hint with a certain degree of positiveness at the probable inferiority of its wares, it is less injurious than I have been inclined to regard it."

"Fence advertising cannot be too emphatically condemned; to characterize it as vile is scarcely to do it adequate justice. It is primarily objectionable, because it brings the manufacturers who wish to advertise into doubtful company on the public highway; and every prudent business man must know, if he has given to his advertising the careful attention it deserves, that the money devoted to papering fences is utterly wasted. We know a gentleman who expends \$150,000 annually for advertising, but you cannot find his name on the fences; he is the best advertiser in the country, but there is nothing comical or grotesque about his way of doing business."

"The glaring poster neither inspires confidence nor conveys the information the public desire; and if it would make the best possible use of our money in giving publicity to our claims as manufacturers, we should patronize able and responsible newspapers. The newspaper is immeasurably the best medium open to our trade; the most liberal and expert advertisers testify to its value; and in the employment of its columns we would find a means of escape from the wasteful, undignified and ineffective methods to which so many now resort in their eager desire to secure attention and patronage."

## OUR AGENTS.

OUR FRIENDS can do much in aid of our paper and the cause of practical knowledge and science, by assisting Agents in their labors of canvassing, by lending their influence and encouraging favors. We intend to send none but worthy men.

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A. C. KNOX—Pacific Coast.  
C. N. WEST—Santa Cruz, Monterey and San Benito counties.  
A. C. CHAMPION—Tulare, Fresno and Inyo counties.  
JOSEPH DUMICK—Mendocino, Humboldt and Del Norte counties, and Oregon.  
W. D. WHITE—San Bernardino and Los Angeles counties.  
J. W. A. WRIGHT—Sacramento, Placer and San Joaquin counties.  
B. E. LLOYD—Alameda, Contra Costa and Napa counties.  
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Any such device is an infringement of United States Letters Patent, granted to me on the 10th of May, 1876, and re-issued September 19th, 1876.

I have commenced suit against Richard Hoskin for infringing my said patent, and intend to prosecute all parties using such Deflectors without license from me, there being no other way to protect my rights.

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10 Saw Mills, 3 Planing Mills, 1 Sash  
 and Door Factory,

149 Miles V Flume, 10 Miles of Tramway

157 Miles of Telegraph Line, 13 Telegraph

Stations, and Employ 475 Men

and 550 Oxen and Horses.

The Sugar Pine is unsurpassed in quality, and the  
 whole Coast can be supplied.

The Yellow Pine is firm, fine grained and superior to  
 any other hard pine for Flooring, Stepping, etc.

The Spruce has great strength, durable when exposed,  
 and especially adapted to Bridge and Ship Building, while  
 the Fir and Cedar are as valuable for a great variety of  
 purposes.

Last year thirty millions of feet were cut, and the estimate  
 for 1877 is fifty millions; fifteen millions are now on  
 hand, thoroughly seasoned by the hot climate of Red  
 Bluff and Chico.

Large orders can be filled on a day's notice for  
 kinds of

**BUILDING MATERIALS,**

Rough or dressed dry, by which elegant and substantial  
 work may be accomplished without delay at the usual  
 cost for green lumber.

Orders for the interior filled at less than San Francisco  
 prices and freight.

Doors, Sash and Blinds always on hand in large  
 quantities. Address

**SIERRA FLUME AND LUMBER CO.,**

PRINCIPAL OFFICES:

Red Bluff; Chico; San Francisco—Corne  
 Fourth and Channel Ste

**MINING INTEREST FOR SALE.**

For a small amount, in several claims on one of the

**RICHEST LEDGES IN ARIZONA.**

Money needed for development. The ore will pay a hand-  
 some margin to ship to the city. Apply at this office.

**San Francisco Cordage Company.**

Established 1856.

We have just added a large amount of new machinery of  
 the latest and most improved kind, and are again prepared  
 to fill orders for Rope of any special lengths and sizes. Con-  
 stantly on hand a large stock of Manila Rope, all sizes;  
 Tarred Manila Rope; Hay Rope; Whale Line, etc., etc.

**TUBBS & CO.,**

611 and 613 Front Street, San Francisco

**STEEL CASTINGS,**

Solid and Homogeneous. An invaluable substitute for  
 expensive forgings, or for Cast Iron requiring great  
 strength. Send for circular and price-list to

**CHESTER STEEL CASTINGS CO.,**

EVELINA STREET, PHILADELPHIA, PA

**French Savings and Loan Society,**

411 Bush Street, above Kearny, SAN FRANCISCO

**G MAHE, Director,****GUIDO KUSTEL,****MINING ENGINEER and METALLURGIST.**

P. O. Address: ALAMEDA, CAL.



Continued from Page 293.

shipped 6,500 pounds of ore which the owners say is from the same pay streak as that from which the former owners sold one ton in San Francisco for over \$18,000. This is said to be a better lot of ore than that exhibited here of which we spoke last week. We are told that \$3,200 will pay the expenses of taking out this ore, boxing and shipping it to this place.

**LITTLE SPRING MINE.**—*Arizona Miner*, Oct. 27: Messrs. Gudgeon & Winslow have recently taken out some excellent ore from the Little Spring mine, situated about three miles east of town. Assays from ordinary ore gives the value at \$353 to the ton.

**BIO BUE.**—We learn that the Messrs. Devore & McMichael, who purchased the Clifton mine from Charles E. Hitchcock for \$1,000 about two months since, have been taking out weekly since that time, by anastha process, \$100 per week.

Work on the Adel mine, about five miles south of town, is progressing nicely and it is yielding a large quantity of ore which assays \$175 to the ton.

## Oregon.

**THE TELLURUM MINES.**—*Oregonian*, Nov. 3: Mr. I. N. Miles, of Canyonville, Douglas county, has been in the city during the past week for the purpose of interesting capital to aid in the development of the several rich lodes of the Tellurium mining company. These mines are only about two and a half miles from Canyonville, and are said to be of great richness and extent. There are six well-defined lodes, specimens of which have been assayed and found to yield largely of gold, silver and copper. Several shafts have been sunk, one to the depth of 50 feet. At present a force of 15 men are engaged day and night in working these mines, and already 100 tons of the rock have been got out. The furnace has been completed and will soon be in working order.

**LUCY QUEEN.**—A meeting of the Directors of this company was held in Roseburg on the 19th. It was ordered that work on the mine be commenced and the water taken from the shaft, preparatory to sinking to a greater depth and getting out ore from the mine, and that material be purchased for erecting a roasting and chlorizing furnace. Prof. J. M. Tiernan, mining engineer of this city, has been engaged to inspect and work the mine.

The Emeline quicksilver company, in Jackson, have shut down their retort until next spring. Work on the vein continues.

**QUARTZ MINES** on the Pebastin (Yakima) are still thought to be valuable, but owing to lack of capital their development is rather slow.

The placer claim of Baisley & Bulger, near Pochontas, Baker county, yielded \$11,000 as a result of six months' run. It was done with hydraulic pipe and the labor of four men.

Two mining companies at Spanish gulch, on the road between here and Canyon City, cleaned up, a few days ago, \$6,000 in gold dust. This was the second clean-up this season.

**SALT LAKE MINES.**—*Willamette Farmer*, Nov. 3: Mr. Frank Glover, of the Capital Mining company, arrived in the city yesterday and reports work progressing rapidly on the shaft which is being sunk to give ventilation to the tunnel. He also reports good work being done in the Nonpareil mines, which lie a short distance from the Capital lead.

## Utah.

**LITTLE COTTONWOOD.**—*Salt Lake Tribune*, Nov. 3: The Emma continues to make regular shipments of high-grade ore, which is sampled at the Pioneer mills and sold to the Sundry smelters. The Carbonate shows up bigger than ever, each foot of development adding value to the property and profit to the owners. Indeed, it is now believed that the mine will develop into the grandest piece of mining property on the Pacific coast. The grade of the ore keeps up in silver and lead, and bids fair to knock the spots off the Eureka, Nev., mines next season. Mr. John McDonald, the old-time recorder of Little Cottonwood, has made a new and rich discovery just below the Flag-staff dump, which promises to be a second Emma. What the extent of the vein is and the assay value of the ore we have not learned, but those who have visited the new prospect say that Mac has struck it big at last.

## The Mining Share Market.

A little life has been infused into the market of the past week by reported developments in the east crosscut of the 1900-foot level of the Ophir mine, backed by an improvement in the 1750-foot level of the Consolidated Virginia. What these strikes amount to is a matter of profound mystery to the general public, as both mines have been closed to visitors, pending the examination of "inside" experts, who have flocked to Virginia. Considerable complaint is made that the lesser stockholders are not permitted to see for themselves. According to law any one representing a one-hundredth interest in a mine can demand and secure admittance to it, and so the lesser stockholders can, of course, obtain their own reports by combining and bringing together sufficient stock. Meanwhile the news, while not authoritatively verified, has had its influence on the market, and has caused a small spurt in Ophir, which has not been sympathized in to any great extent by the other stocks. Of the outside stocks, Grand Prize, of Tuscarora, has been the sensation, making a break to \$10.50 on Wednesday, under heavy pressure.

**THE ARIZONA BONANZA.**—We are asked for further information concerning the "Arizona bonanza," of which we spoke last week; and whether, notwithstanding the very rich ore, there is not stock for sale in the company? We have never seen the mine and are, therefore, not competent to pass on its merits. The information published, we derived, as stated, from the superintendent who is now in town. We have no knowledge of the value of the stock or the value of the mine outside of seeing the ore which, of itself, is a massive showing.

**LUTTRELL'S bill** in Congress for the introduction of fresh water on the desert west of Fort Yuma is the Wozencraft measure of last session, with two modifications. The first provides that the Secretary of the Interior shall appoint three competent persons to appraise the present value of the lands, and that Wozencraft and his associates shall pay for them at such appraised valuation before acquiring title. The second amendment provides that water rates, to be fixed by the army engineer detailed by the Secretary of War for the examination of the work, as it progresses. The bill requires the work to be commenced within two years and completed in 10.

## Duhem & Bennett's Dry Placer Amalgamator.

**EDITORS PRESS:**—We are in receipt, through your having noticed the "dry placer amalgamator," of numberless inquiries as to the construction, capacity, operation and cost of the machines. We send to your address a copy of the *Mining Record*, in which is an answer to all these questions by a disinterested eye-witness, Mr. J. Vandemoer. If you will be kind enough to copy, you will furnish information much desired by many readers of your truly valuable journal.

DUHEM &amp; BENNETT.

Denver, Colorado, Oct. 25th, 1877.

In my former letters I have several times briefly referred to the so-called "dry placer amalgamator," but with the fear that like its many predecessors, it would fail to warrant the high expectations entertained of it by the inventors, Messrs. Duhem & Bennett of this city. I am agreeably disappointed, however, in this respect, and may say that the machine, by actual working in the mine, has proven itself to be not only all that the inventors have claimed, but more. This, of course, opens up a new field of industry, which will furnish employment to thousands of men, and bring into market at high figures many thousands of acres, indeed, I might say, square miles of hitherto worthless mines, though rich in the precious metal, because they were entirely unavailable by any of the methods in use for extracting the gold. It is well known that, without a large and continuous supply of water, placer gold cannot be saved by the hydraulic or sluice. It is equally well known, that only the heavy gold can be saved by these methods. Every placer mine has a proportion of fine gold, which is invariably carried off by the sluice stream. It is a fact conceded by all experienced sluice miners, that mining operations in the upper waters of a stream in the course of a year or two, will produce profitable placers in the bars or bends below, so imperfectly do these contrivances for saving the gold perform their work. In fact, tailing mines are worked with much profit, wherever they exist, though the gold of course is much finer than in the original deposit, and much is again lost. The dry placer amalgamator is intended not only to work ground which is lacking in water supply, but to save both the coarse and the fine gold. Much doubt was entertained as to the possibility of handling with the machine a sufficient amount of dirt to make it profitable even though all the gold were saved. The practical test has settled this question.

The machine, substantially constructed, mostly of iron, and weighing about 4,000 pounds, is mounted permanently on wheels. It is accompanied with an eight-horse-power engine and boiler, also mounted, so that the whole is extremely portable. An automatic feeder passes the dirt into a partly submerged, revolving cylindrical grate and sieve, in which such coarse material as stones, gravel, etc., are separated from the finer, most thoroughly scoured, and thrown out as part of the tailings. The finer particles pass through the grate and sieve, dropping through water to the sides and bottom of a main tank, which is lined with amalgam plates; here it is received by a series of water jets which throw it upward and forward toward the tailing end of the tank. Each time that it is thus thrown, it falls on a new spot on the plates, but each time a little nearer the tailing tank, in which it is finally thrown; thence it is taken, drained, and thrown out by a simple arrangement. In passing from one end to the other the sand passes over 26 of these jets. The heavy gold settles at once between and below the jets, and is not again disturbed until the clean-up. The machine which I have seen working in South Park, on an abandoned mine, handles from 80 to 100 cubic yards per day, by actual measurement. And though constantly tested by parties who seek to reach the truth, no gold has yet been detected in its tailings.

The mine upon which the trial machine is placed had been tried with the sluice, and abandoned, the two men having cleaned up less than \$6 for their joint labor for six days. This, together with the fact that on this mine could be found various kinds of dirt, renders it the best spot that could be selected for a thorough and severe test. The machine is taking out from this mine from \$125 to \$150 per week, at a necessary expense of about \$60 to \$75 per week. In conversation with the proprietors, we were informed that the present machine is extremely faulty as compared with future machines, and that, without perceptibly increasing their size or weight, they will increase their capacity to upwards of 100 cubic yards per day of 10 hours.

A number of machines are already contracted for by parties who have watched its operation. It is the purpose of the proprietors to organize a stock company in each gold-bearing State and Territory, as fast as capital comes forward, to manufacture, use, and rent out in its own State or Territory, machines under their patents. The company for this State is already organized, and its prospectus will soon be in print. It is understood that the rent charged by this company will be \$100 per week, and many parties are ready to take them at that rate. This may seem a high price, but, when it is taken into consideration that the say 40 inches of water required to run 40 yards of dirt per day, will supply 20 of these machines, running about 2,000 cubic yards per day; while to run 40 yards

in the ordinary sluice costs from \$10 to \$12, an amount which will run 100 yards through the machine; moreover that, while the sluice will not save more than 60% to 70% of the gold under the most favorable conditions, and often not more than 10% or 20%, this machine practically saves it all; therefore, the rate of rent will not seem so extravagant. The cost of the machines complete, including engine, is about \$2,500. This invention will before long undoubtedly cause the development of large tracts of placer ground, where the necessary water for sluicing could be brought only at a tremendous expense.

## Technical Education of Miners.

It is unfortunate that more attention has not been paid in the United States to technical education for miners. England, France and Germany lead us in this respect, for in all those countries there are schools for miners which exist under Government patronage. The German schools is the best, and is world-renowned; its graduates holding responsible positions as superintendents of mines and metallurgical establishments all over the globe. Most of our prominent experts on this coast were educated in Freiberg, which shows that where there are so many good miners, their training must have been the best. Our Government, however, has not turned its attention in this direction at all, and beyond the Columbia School of Mines in New York, and such mining departments as exist in various colleges and universities, there are no mining schools in America, and there are none at all under the patronage of the Government.

Working miners, themselves, seem to care too little for their own good, for pursuing studies in connection with their own good, and such schools as are open to them are attended more by those intending to become professional men than by those who do the manual work in the mines. The Royal School of Mines, in London, has comparatively few of this class who avail themselves of the facilities offered for the acquirement of scientific knowledge. The lectures delivered there, however, are published in the papers and a great deal of useful knowledge is disseminated in this way. At that school the mode of instruction is by systematic courses of lectures, by written or oral examinations and by practical teaching in the laboratory and drawing office, and also, under certain conditions, by field excursions. The courses of instruction are distributed over three years, but those students who possess sufficient knowledge may, if they see proper, pass through the whole in two years. Those desirous of obtaining the distinction of Associates of the Royal School of Mines, who acquired a knowledge of the subjects of the first two years, may proceed at once to the courses of the third year by passing the final class examinations on those subjects before the professors, and paying a fee of £1 for each examination. The aggregate fees for the three years are £30, paid in advance or two annual payments of £20 each.

Still the really intelligent student can naturally reduce his expenses by working for exhibitions, prizes and scholarship, of which the school offers a large number. We glean some points on this subject from the *London Mining Journal* of recent date. It seems there are more Royal exhibitions to the Royal School of Mines, Jermyn-street, of the value of 50% per annum, entitling the holders to free admission to all the lectures and the chemical and metallurgical laboratories at the Royal School of Mines, to be held from year to year for three years, on the condition that the holder attends the courses regularly during those years, complies with all the rules laid down for his guidance, and passes the examinations required for the associateship of the school. There are two Royal scholarships of 15% each, which are given to the students who stand highest on the list of those who have passed their examinations for the first year, and a scholarship of 25% to that pupil who has gained the greatest number of marks in the examinations of the first two years. The Royal scholarships will be granted to those students only who have obtained first-class places in the examinations of their year, or in the examinations of at least two of the professors, in the case of such students as take the first two years in one. In addition to these there are the Edwards Forbes medal and a prize of books competed for annually, and to be awarded to the student who, having passed in the first class in the natural history examination, shall have obtained the greatest total number of marks in that examination, and in the examination in paleontology for the year; the De la Beche medal awarded annually to the student who, having passed the highest in the first class in mining, stands high in the examinations of any other branch of science taught in the school, a bronze medal and a prize of books, established in memory of the late director, Sir Henry De la Beche; and though last, not least, the Murchison medal and a prize of books, the gift of the late director, Sir Roderick Murchison, awarded annually to the student who stands highest in the geological examination, having passed in the first class in any one of the other subjects taught in the school.

The principal object of the Royal School of Mines, and that has certainly been fairly attained, has always been and is, to discipline the students of the school thoroughly in the principles of those sciences upon which the

operations of the miner and metallurgist depend. Of course, nothing but experience in the mine and in the laboratory can confer the skill and tact requisite for the practical conduct of those operations; but, on the other hand, it is only by an acquaintance with scientific principles that the beginner can profit by that experience and improve upon the processes of his predecessors. But while it has been the chief aim of the Royal School of Mines, to become to Britain what the Bergakademie of Freiberg and the Ecole des Mines, of Paris are to Germany and to France, the minister by whose instructions the British equivalent to these well known foreign institutions was founded, expressly stipulated that the professors should deliver annually, at a nominal admission fee, a course of lectures to working men. It appears to have been considered right that an institution subsidized by the nation should contribute to a certain extent to the great national object of educating those who are prevented by circumstances from educating themselves. These lectures were commenced in 1851, and the attendance upon them was so large, and the interest taken in this subjects discussed by the classes to whom they were addressed was so great that in the following year the officers of the School of Mines voluntarily determined to increase their labors in this direction, each professor engaging to give a course of six lectures in alternate years—and thus providing the working men with an average of 24, instead of six lectures in each year.

## No Delay in Patent Business.

As Mr. George H. Strong, of the firm of Dewey & Co., and especially engaged in the patent department of our establishment, has recently returned from a visit to the Eastern States, we requested him to prepare for us a brief statement of his observation at the Patent Office in Washington, with reference to the effect of the late fire on the transaction of business. Mr. Strong's personal observation, as will be seen by the note printed below, is that there is no delay or embarrassment whatever in the office at Washington. This fact will be of interest and importance to inventors who may be waiting for assurance of this kind before submitting their cases. Mr. Strong writes as follows:

**EDITORS PRESS:**—The fire at the Patent Office occurred during my visit to the Eastern States, and I purposely delayed visiting Washington for some time, fearing that affairs would be so deranged by the accident, that no business could be done for some time. When, after 10 days, I finally went to the Patent Office, I was surprised to find that business was moving on in its accustomed channel, with no appearance of any hindrance, and that there had been no interruption beyond the one day necessary to rearrange and clean up the various offices. Owing to the energetic action of the Commissioner of Patents and the able assistance of the force of examiners, clerks, etc., in the office, everything was restored to working condition in an exceedingly short time.

As has before been stated, the damage was confined mostly to the destruction of a vast number of old models which formed a part of the Patent Office museum; some of them being of course interesting because they showed the first steps and gradual development of industries which have since reached enormous proportions, but the model cases were altogether too crowded, and when the burned portion has been restored and a redistribution of the remaining models takes place, the general visitor will find very little to remind him of the loss. As the museum or model room was situated upon the third floor, which was of marble and fire proof, the fire was confined to this floor upon two sides of the hollow square occupied by the office, leaving the remaining two sides unharmed.

The business of the office is carried on upon the first and second floors, and the specifications and drawings being kept here, were unharmed, as were also most of the models in applications which were not finally disposed of, either by being allowed or rejected.

As the examinations are made by the aid of the specifications and drawings, it will be seen that the loss of the old models is of comparatively little moment. An effort will be made, however, to replace some of the models, and the Office issues a circular to each inventor whose model has been destroyed, stating that such model may be replaced if made to correspond with the specification and drawings, but the replacement of the model is optional with the inventor.

Our clients need have no fear that their business will not receive the prompt attention heretofore given to it. The firm of Dewey & Co. have the reputation in the Patent Office of being conscientious and careful of the interests of their clients, and my recent visit to Washington has resulted in arrangements by which our business will be even better managed than heretofore.

Geo. H. Strong.

202 Sansome street, S. F., November 8th.

**THE Edinburgh Scotsman's** London correspondent says: "In political circles there is great expectation that Earl Beaconsfield will shortly make a speech on the Eastern question which will provoke the renewal of last year's excitement and agitation. It is reported that he will put his foot down on the question of opening the Dardanelles to Russian and other war vessels."



Continued from page 297.

**Smartville.** The total capacity of all the ditches is 5,000 Smartville miner's inches, and the whole investment in this class of property in this locality approximates \$1,200,000. The Spring Valley and Cherokee ditch is 32 miles long, and has 3 1/2 miles of iron pipe, 30 inches in diameter. The size of the ditch averages 5 feet wide, 3 1/2 feet deep, discharging about 2,000 inches of water.

The Hendricks ditch in Butte county, is 4 1/2 miles long. Grade of the upper line of ditch, 12.8 feet per mile. Grade of the lower line, 6.4 per mile. Respective sizes, 5 feet wide, 2 feet deep. Total cost, including the Beatson ditch and Oregon Gulch ditch, \$136,150.

The La Grange ditch, including the Patrikville branch, is over 20 miles in length. Size, 9 feet on top, 6 feet bottom, 4 feet deep. Grade from 7 to 8 feet to the mile. The greater part of the ditch is cut in granite, and in places there are solid walls 50 to 70 feet high, built of stone. It discharges 3,000 miner's inches of water, and its cost to date is about \$450,000.

General Observations.

Ditches in California with carrying capacities as large as 80 cubic feet per second have been built, and are now in successful operation, with grades of from 16 to 20 feet per mile. In a mountainous country where steep grades can be generally obtained by a slight increase in the length of the canal, and where the cost of excavation is large, a great saving can be effected by using the smallest sized canals and aqueducts practicable to carry the given quantity of water, or, in other words, by running water rapidly through a small channel rather than slowly through a large one. It is found to be safer and more economical, on account of the deep snows and terrific storms which rage in the mountains during the winter, to run and maintain in repair narrow and deep ditches on heavy grades than broad ones with light grades. The experience of ditch builders in this State has been highly favorable to these steep grades, but little trouble being caused by the washing of the banks due to high velocities. In the valleys with ash soil such grades, of course, would not be practicable.

See Raymond's Report 1873, pp. 73, 74. The original ditch, about 10 miles long, is said to have cost \$375,000. Since its completion the Patrikville ditch and reservoir have been built at a cost of \$75,000.

These narrow ditches with steep grades do not discharge within from 25 to 30 per cent. of the amount of water given by the formulae for "the discharge of water in canals."

Notices of Recent Patents.

Among the patents recently obtained through Dewey & Co.'s Scientific Press American and Foreign Patent Agency, the following are worthy of mention:

**WEIGHING SCOOP.**—Michael L. Mery, Chico, Butte Co. This is a novel combination scoop and weighing device, and consists in constructing a scoop in combination with a spring balance, located in the handle, with scale and pointers on the handle, and a stop so arranged as to save the spiral balance spring from damage when the scoop is thrust into any hard unyielding material. The invention also relates to certain anti-frictional devices and a balance adjustment. The combination of handle and stem is made stiff and unyielding by reason of the stop. When the material to be weighed is raised up in the scoop the stop is released and the balance being free to act, the weight of the material will show on the scale. This arrangement of scoop and scale gives two useful articles in one, and is very serviceable where a large amount of material has to be divided by weight into small quantities.

**CHEESE PRESS.**—Wm. H. Ahrens, San Luis Obispo. The patent covers certain improvements in presses, more particularly applicable to cheese presses. It consists of a frame within which the board or platen moves up and down, carrying with it the cheese or article to be pressed. The platen frame is suspended from a lever which has its outer end fixed, and from its inner end a bar extends down so as to rest upon the pressing board, so that the weight of the article to be pressed and the movable frame serves to do the pressing without additional weights. The moving parts are elevated at will by a drum and crank.

**DEVICE FOR RELEASING ANIMALS FROM STALLS.**—Samuel B. Martin, S. F. This invention relates to a novel means of releasing animals from their stalls or fastenings, either singly, for the purpose of removing them for ordinary use, or, in case of a fire or other emergency, to free all the animals at once by a single operation. It consists in the use of a stationary socketed plate, which is secured to the side of the stall, and a sliding bolt, which crosses the socket, and which is provided with a local means for the operation of each one singly, and a general connection whereby all of the fastenings may be operated at once.

WOODWARD'S GARDENS has the following new attractions: The buffalo chase; large whale skeleton; new museum; improvements in the zoological department, besides the other features which have made it popular.

PATENTS AND INVENTIONS.

List of U. S. Patents Issued to Pacific Coast Inventors.

[FROM OFFICIAL REPORTS FOR THE MINING AND SCIENTIFIC PRESS, DEWEY & CO., PUBLISHERS AND U. S. AND FOREIGN PATENT AGENTS.]

By Special Dispatch from Washington, D. C.

Week Ending October 25th, 1874.

MOLD FOR MAKING PIPE FROM MORTAR.—Ezra M. Hamilton, Los Angeles, Cal.  
LATHS FOR VEHICLE SEATS.—J. J. Newcomb, S. F.  
MACHINE FOR MAKING BARREL HEADS.—David Pomeroy, S. F.  
BREACH-LOADING FIRE-ARMS.—Henry Sulter, Baker City, Oregon.  
TRANSMITTING TIME MOVEMENT TO DISTANT PLACES.—Hermann J. Wenzel, S. F.  
BEERY BOXES.—Chas. W. Weston, S. F.  
STARCH FOR FOOD.—Krygers, Rasmussen & Co., Gold Run, Cal.

—The patents are not ready for delivery by the Patent Office until some 14 days after the date of issue.  
NOTE.—Copies of U. S. and Foreign Patents furnished by DEWEY & CO., in the shortest time possible (by telegraph or otherwise) at the lowest rates. All patent business for Pacific coast inventors transacted with perfect security and in the shortest possible time.

THE principal portion of the town of Cuffey's Cove, Mendocino county, was destroyed by fire on Tuesday night.

Gov. IRWIN has commissioned Dr. W. G. Wayman, of this city, a member of the State Board of Health, vice Dr. Herz, who has left the State.

Signal Service Meteorological Report.

Week Ending November 6, 1877.

HIGHEST AND LOWEST BAROMETER.						
Oct. 31	Nov. 1	Nov. 2	Nov. 3	Nov. 4	Nov. 5	Nov. 6
30.12	30.23	30.08	30.15	30.21	30.17	30.20
30.05	30.13	30.01	30.07	30.16	30.02	30.06
MINIMUM AND MAXIMUM THERMOMETER.						
41	61	57	50	50	64	62
49	49	52	50	51	55	54
MEAN DAILY HUMIDITY.						
73	71	76	81	87	89	79
PREVAILING WIND.						
W	N	NW	W	SE	SE	W
WIND—MILES TRAVELED.						
170	164	02	02	210	169	173
STATE OF WEATHER.						
Clear.	Fair.	Rainy.	Fair.	Rainy.	Rainy.	Clear.
RAINFALL IN TWENTY-FOUR HOURS.						
	.08		.21	.25	.07	
Total rain during the season, from July 1, 1877. 1.28 in						

METALS.

[WHOLESALE.]

THURSDAY, M., November 8, 1877.

IRON.—		
American Pig, ton.	28 00	@ 32 00
Scotch Pig, ton.	32 00	@ 33 00
White Pig, ton.	28 00	@ —
Oregon Pig, ton.	—	@ —
Refined Bar.	5 00	@ 6 1/2
Horse Shoes, keg.	5 00	@ —
Nail Rod.	—	@ 7 1/2
Norway, Oval.	—	@ 7 1/2
Roll.	—	@ —
COPPER.—		
Copper Tinned.	37 00	@ 40
Sheathing, lb.	37 00	@ 40
Sheathing, Yellow.	21 00	@ 22 1/2
Sheathing, Old Yellow.	10 00	@ 11
Composition Nails.	24 00	@ —
Composition Bolts.	24 00	@ —
STEEL.—		
English Cast, lb.	14 00	@ 5
Anderson & Woods, ordinary sizes.	16 00	@ —
Drill.	16 00	@ —
Flat Bar.	15 00	@ 18
Plow Steel.	8 1/2	@ 12 1/2
TIN PLATES.		
10x14 E O Charcoal.	8 50	@ 9 00
Banca Tin.	24 00	@ —
Australian.	19 00	@ 20
ZINC.		
By the Cask.	11 00	@ —
Zinc Sheet 7x3 ft. 7 to 10, lb.	11 00	@ —
7x3 ft. 11 to 14.	11 00	@ —
8x4 ft. 8 to 10.	12 00	@ —
8x4 ft. 11 to 10.	12 00	@ —
NAILS.		
Assorted sizes.	3 00	@ 25
QUICKSILVER.—		
By the lb.	47 1/2	@ 50

Gold, Legal Tenders, Exchange, Etc.

[Corrected Weekly by Sutro & Co.]

SAN FRANCISCO, November 7, P. M.  
LEGAL TENDERS IN S. F., 11 A. M., 97 1/2 @ 98. SILVER, 31 @ 40  
GOLD IN N. Y. 102 1/2  
GOLD BARS, 800 @ 910. SILVER BARS, @ 214 3/4 cent. dia. count.  
EXCHANGE ON NEW YORK 1/2, on London bankers, 49 1/2;  
Commercial, 50 1/2; Paris, five francs @ dollar; Mexican dollars, 36.  
LONDON Ounces, 95 3/16; Bonds, 106 1/2.  
QUICKSILVER IN S. F., by the flask, 46 @ 47 1/2.

Mining and Other Companies.

Persons interested in incorporated shares will do well to recommend the publication of the official notices of their companies, Oregon and Nevada, in this paper, as the cheapest appropriate medium for the same.

California and Oregon Land Company.

Location of principal place of business, San Francisco, California. Location of works, Jackson County, Oregon. Notice is hereby given, that at a meeting of the Board of Directors, held on the seventeenth day of October, 1877, an assessment, No. 1, of thirty-five cents per share was levied upon the capital stock of the corporation, payable immediately in U. S. gold coin, to the Secretary, at the office of the company, 418 California Street, San Francisco, California. Any stock upon which this assessment shall remain unpaid on the twenty-eighth day of November, 1877, will be delinquent, and advertised for sale at public auction, and unless payment is made before will be sold on Monday, the twenty-fourth day of December, 1877, to pay the delinquent assessment, together with costs of advertising and expenses of sale. By order of the Board of Directors.  
J. W. CLARK, Secretary.  
Office, 418 California Street, San Francisco, California.

Excelsior Silver Mining Company.—Prin-

cipal place of business, San Francisco, Cal. Location of works, Potosi District, Lincoln County, Nevada. Notice is hereby given that at a meeting of the Board of Directors, held on the second day of November, 1877, an assessment of ten cents per share was levied upon the capital stock of the corporation, payable immediately in U. S. gold and silver coin, to the Secretary, at the office of the Company, 312 Post Street, San Francisco, Cal. Any stock upon which this assessment shall remain unpaid on the third day of December, 1877, will be delinquent, and advertised for sale at public auction, and unless payment is made before will be sold on Monday, the twentieth day of December, 1877, to pay the delinquent assessment, together with costs of advertising and expenses of sale.  
W. A. KOLLMYER, Sec'y.  
Office, 312 Post Street, San Francisco, Cal.

Fresno Quicksilver Mining Company.—

Location of principal place of business, San Francisco, Cal. Location of works, Mexico, Fresno county, Cal. Notice.—There is delinquent upon the following described stock, on account of assessment No. 5, levied on the nineteenth day of September, 1877, the several amounts set opposite the names of the respective shareholders, as follows:  
Names. No. Certificate. No. Shares. Amount.  
Brown, W. E. 289 7000 \$140 00  
Brown, W. E. 307 7000 140 00  
Friedberg, Chas. 217 100 6 00  
Friedberg, Chas. 309 400 2 00  
Haley, John J., trustee. 87 1000 20 00  
Haley, John J., trustee. 88 1000 20 00  
Haley, John J., trustee. 89 1000 20 00  
Haley, John J., trustee. 90 680 13 60  
Haley, John J., trustee. 255 4320 80 40  
Haley, John J., trustee. 257 7000 140 00  
Robinson, E. J. 290 500 10 00  
Robinson, E. J. 291 500 10 00  
Robinson, E. J. 320 1000 20 00  
Robinson, E. J. 329 655 13 10  
Robinson, Clara M. 294 25 50  
Robinson, Clara M. 322 25 50  
And in accordance with law, and an order of the Board of Directors, made on the thirtieth day of September, 1877, so many shares of each parcel of such stock as may be necessary, will be sold at public auction, at the office of the company, 414 California Street, San Francisco, California, on Tuesday, the thirteenth day of November, 1877, at the hour of one o'clock P. M., of said day, to pay said delinquent assessment thereon, together with costs of advertising and expenses of sale.  
R. WEGENER, Sec'y.  
Office, 414 California Street, San Francisco, Cal.

Mariposa Land & Mining Company of

California.—Location of principal place of business, San Francisco, California. Location of works, Mariposa County, California. Notice.—There is delinquent upon the following described stock, on account of assessment (No. 12) levied on the 12th day of September, 1877, the several amounts set opposite the names of the respective shareholders, as follows:

COMMON STOCK.		
Names.	No. Certificate.	No. Shares. Amount.
Amblman, Edgar M.	1406	100 100 00
Amblman, Edgar M.	1523	100 100 00
Amblman, Edgar M.	1629	100 100 00
Amblman, Edgar M.	1632	100 100 00
Brumagim, J. H.	1112	100 100 00
Brumagim, J. H.	1117	100 100 00
Brumagim, J. H.	1113	100 100 00
Brumagim, J. H.	1110	100 100 00
Brumagim, J. H.	1351	100 100 00
Brumagim, J. H.	1376	100 100 00
Brumagim, J. H.	1387	100 100 00
Brumagim, Fred P.	1276	100 100 00
Brumagim, Fred P.	1277	100 100 00
Brumagim, Fred P.	1278	100 100 00
Brumagim, Fred P.	1279	100 100 00
Brumagim, Fred P.	1300	100 100 00
Brumagim, Fred P.	1630	100 100 00
Brumagim, Fred P.	1643	100 100 00
Brumagim, Fred P.	1317	100 100 00
Browne, George.	1603	100 100 00
Browne, George.	1009	100 100 00
Bernheimer, I and S.	1001	100 100 00
Boody & Co, D. A.	A 24	50 50 00
Boody & Co, D. A.	A 25	50 50 00
Boody & Co, D. A.	A 1650	100 100 00
Brown, D.	1240	100 100 00
Cody, Edmund.	A 20	50 50 00
Collins, C. A.	1287	100 100 00
Connor, W. P.	1268	100 100 00
Cowles, Joseph N.	A 22	25 25 00
Cowles, Joseph N.	A 23	25 25 00
Dusenbury, J. M.	1319	100 100 00
English, William.	478	100 100 00
English, William.	478	100 100 00
Elston, W. A.	1500	100 100 00
Elston, W. A.	1501	100 100 00
Elston, W. A.	1502	100 100 00
Elston, W. A.	1503	100 100 00
Elston, W. A.	1504	100 100 00
Fay, Fred.	1470	100 100 00
Harriott & Noyes.	1253	100 100 00
Hedges, Allen.	1160	100 100 00
Henry, T. L.	1074	100 100 00
Henry, T. L.	1075	100 100 00
Henry, T. L.	1076	100 100 00
Henry, T. L.	1077	100 100 00
Henry, T. L.	1078	100 100 00
James, W. H.	1668	100 100 00
James, W. H.	1668	100 100 00
Kennedy, Hutchinson & Co.	1640	100 100 00
Kennedy, Hutchinson & Co.	1641	100 100 00
Kennedy, Hutchinson & Co.	1207	100 100 00
Kennedy, Hutchinson & Co.	1208	100 100 00
Kennedy, Geo H.	1137	100 100 00
Kennedy, Geo H.	1138	100 100 00
Loth, M.	412	50 50 00
Maas, Frederick M.	1626	100 100 00
Maas, Frederick M.	1628	100 100 00
Maas, Frederick M.	1620	100 100 00
Monroe, E. S.	A 29	50 50 00
Otis & Co, F. A.	1313	100 100 00
Otis & Co, F. A.	1320	100 100 00
Post, Joel B.	1264	100 100 00
Post, Joel B.	1265	100 100 00
Rodwell, C. M.	1227	100 100 00
Rodwell, C. M.	1228	100 100 00
Rathborne, R. Wm.	319	100 100 00
Rathborne, R. Wm.	320	100 100 00
Rathborne, R. Wm.	321	100 100 00
Rathborne, R. Wm.	322	100 100 00
Rathborne, R. Wm.	323	100 100 00
Rathborne, R. Wm.	324	100 100 00
Rathborne, R. Wm.	325	100 100 00
Rathborne, R. Wm.	326	100 100 00
Rathborne, R. Wm.	327	100 100 00
Rathborne, R. Wm.	328	100 100 00
Richmond, H. W.	1656	100 100 00
Richard, R. H.	1665	100 100 00
Richard, R. H.	1666	100 100 00
Schwartz, M. M.	1611	100 100 00
Schwartz, M. M.	1612	100 100 00
Stanton, J. S.	1681	100 100 00
Townsend, W. B.	1616	100 100 00
Townsend, W. B.	1617	100 100 00
Townsend, W. B.	1618	100 100 00
Townsend, W. B.	1610	100 100 00
Townsend, W. B.	1620	100 100 00
Townsend, W. B.	1621	100 100 00
Townsend, W. B.	1622	100 100 00
Townsend, W. B.	1623	100 100 00
Townsend, W. B.	1624	100 100 00
Townsend, W. B.	1625	100 100 00
Vanderhoof, H. B.	1599	100 100 00
Vanderhoof, H. B.	1600	100 100 00
Vanderhoof, H. B.	1604	100 100 00

Waldron, Albert.	1667	100	100 00
Joslyn, Bach & Co.	unissued	100	100 00
Robins, Howell & Co.	unissued	1000	1000 00
Smith, Morris H.	unissued	100	100 00
White, Morris & Co.	unissued	200	200 00
Weeks, W. A.	unissued	100	100 00

PREFERRED STOCK.

Ackerman, T. J.	A 17	54	54 00
Adams, Thomas.	1190	100	100 00
Adams, Thomas.	1191	100	100 00
Bernheimer, I and S.	1350	100	100 00
Bernheimer, I and S.	1351	100	100 00
Bernheimer, I and S.	1352	100	100 00
Bernheimer, I and S.	1353	100	100 00
Bernheimer, I and S.	A 74	37	37 00
Bernheimer, I and S.	A 75	50	50 00
Bernheimer, I and S.	A 76	50	50 00
Brumagim, J. H.	1308	100	100 00
Brumagim, Mark.	1238	100	100 00
Brumagim, Mark.	1239	100	100 00
Brumagim, Fred P.	1276	100	100 00
Brumagim, Fred P.	1398	100	100 00
Brumagim, Fred P.	1399	100	100 00
Brumagim, Fred P.	1400	100	100 00
Brown, George.	A 86	18	18 00
Birmingham, D. Walton.	1329	100	100 00
Birmingham, D. Walton.	1330	100	100 00
Birmingham, D. Walton.	A 71	50	50 00
Boody & Co, D. A.	A 91	10	10 00
Butt, W. N.	A 95	37	37 00
Cutting & Co, R. L, Jr.	A 88	35	35 00
Cutting & Co, R. L, Jr.	1389	100	100 00
Cutting & Co, R. L, Jr.	1390	100	100 00
Cutting & Co, R. L, Jr.	1371	100	100 00
Cutting & Co, R. L, Jr.	1372	100	100 00
Cutting & Co, R. L, Jr.	1373	100	100 00
Cutting & Co, R. L, Jr.	1374	100	100 00
Cutting & Co, R. L, Jr.	1375	100	100 00
Cutting & Co, R. L, Jr.	1376	100	100 00
Cutting & Co, R. L, Jr.	1377	100	100 00
Cutting & Co, R. L, Jr.	1378	100	100 00
Cutting & Co, R. L, Jr.	1379	100	100 00
Cutting & Co, R. L, Jr.	1380	100	100 00
Cutting & Co, R. L, Jr.	1381	100	100 00
Cutting & Co, R. L, Jr.	1382	100	100 00
Cutting & Co, R. L, Jr.	1383	100	100 00
Connett, W. H.	133	100	100 00
Connett, W. H.	434	35	35 00
Cowles, Jos N.	1347	100	100 00
Cowles, Jos N.	1348	100	100 00
Clarke, B. S.	A 78	13	13 00
Hadden, & Co.	1430	100	100 00
Hadden & Co.	A 101	35	35 00
Hoyt, E. C.	A 100	20	20 00
Hoyt, E. C.	A 100	20	20 00
Homans, E. C.	1108	100	100 00
Homans, E. C.	1212	100	100 00
Homans, E. C.	1307	100	100 00
Homans, E. C.	1410	100	100 00
Miller, Alex.	A 103	48	48 00
Oppenheimer, Ed L.	1449	100	100 00
Patton, Mrs E S, Executrix.	1412	100	100 00
Patton, Mrs E S, Executrix.	1413	100	100 00
Patton, Mrs E S, Executrix.	1414	100	100 00
Pearl, W. E.	1433	100	100 00
Pearl, W. E.	1434	100	100 00
Rathborne, R. Wm.	130	100	100 00
Rathborne, R. Wm.	140	100	100 00
Rathborne, R. Wm.	441	2	2 00
Rathborne, R. Wm.	176	100	100 00
Rathborne, R. Wm.	177	100	100 00
Rathborne, R. Wm.	152	100	100 00
Rathborne, R. Wm.	183	100	100 00
Rathborne, R. Wm.	184	100	100 00
Rathborne, R. Wm.	185	100	100 00
Rathborne, R. Wm.	186	100	100 00
Rathborne, R. Wm.	187	100	100 00
Rathborne, R. Wm.	187	100	100 00
Rodwell, C. W.	1272	100	100 00
Rochner, Edward.	1301	100	100 00
Regua, F. L.	1326	100	100 00
Stewart, David.	1415	100	100 00
Stewart, David.	1416	100	100 00
Stewart, David.	1417	100	100 00
Stewart, David.	1418	100	100 00
Stewart, David.	1419	100	100 00
Stewart, David.	1420	100	100 00
Stewart, David.	1421	100	100 00
Stewart, David.	1422	100	100 00
Stewart, David.	1423	100	100 00
Stewart, David.	1424	100	100 00
Stewart, David.	1425	100	100 00
Stewart, David.	1426	100	100 00
Stewart, David.	1427	100	100 00
Stewart, David.	1428	100	100 00
Stewart, David.	1429	100	100 00
Scott & Co, Wm B.	1108	100	100 00
Studwell, John J.	A 06	40	40 00
Studwell, John J.	1401	100	100 00
Studwell, John J.	1402	100	100 00
Studwell, John J.	1403	100	100 00
Studwell, John J.	1404	100	100 00
Studwell, John J.	1405	100	100 00
Weed, Ed H.	1277	100	100 00
Weed, Ed H.	1272	100	100 00
Weil, Henry.	242	100	100 00
Waldron, Albert.	1430	100	100 00
Wills, A. J.	1451	100	100 00
Wills, A. J.	1452	100	100 00
Alexander, H. E.	unissued	300	300 00
Brumagim, J. H.	unissued	100	100 00
Chesham, Mrs Sarah D.	unissued	135	135 00
Connett, W. H.	unissued	214	214 00
Ford, Augustus.	unissued	270	270 00
Litchfield, Edwin C.	unissued	405	405 00
Hollins, Harry B.	unissued	100	100 00
Iselin & Co, A.	unissued	587	587 00
Stryker, Wm S.	unissued	31	31 00
Smith, Morris H.	unissued	400	400 00
Rathborne, R. Wm.	unissued	300	300 00
Underhill, Fredk.	unissued	100	100 00
Whitenwright, Wm.	unissued	805	305 00
Watson, Augustus E.	unissued	300	300 00
Wollberg & Co.	unissued	100	100 00



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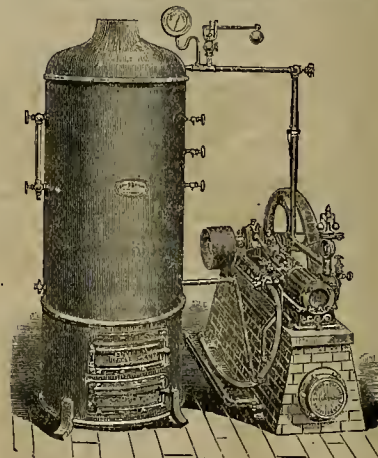
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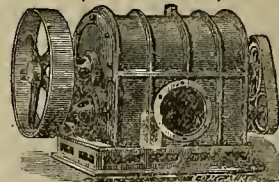
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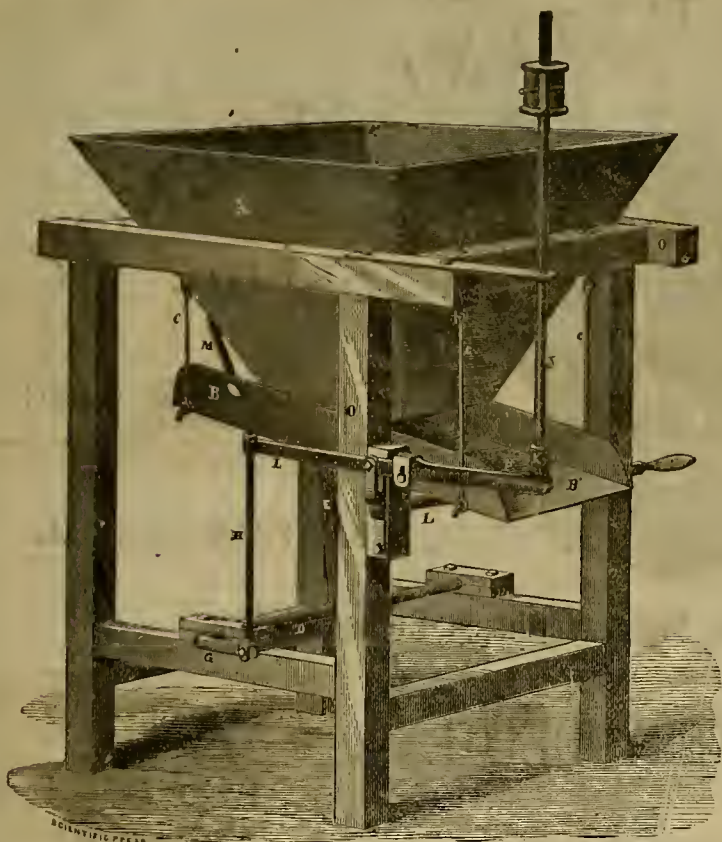
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Extract from a letter from C. G. Rodgers, Superintendent Green Mountain Mining Co., Plumas County, September 10th, 1877: After using both the Tulloch and Hendy Ore Feeders, side by side, for eight months, I can candidly say, that in my opinion, the Tulloch is much the best machine; it will feed any ore that can be fed by machinery; there is nothing about it to wear out, and should anything break, any blacksmith can repair it. Whereas, the Hendy machine is wearing from the moment it is started, and when any thing is worn out, or broken, you must have a machine shop or foundry to make the repairs. The Hendy Feeders are not in use at the Gold Stripe Mill; they were thrown out after a fair trial of some two weeks.

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I call my Automatic Ore Feeder the \$1,000 Challenge, because I challenge the owners or backers of any other feeder to a competitive test for that amount. As Mr. C. G. Rodgers, Superintendent of the Green Mountain mine, near Greenville, Plumas county, appears prominently as a detractor of the merits of my feeder, and seems confident that another one is better, perhaps he will accept this long-standing challenge which the owners of other patents will not, and give me an opportunity to prove publicly the superiority of my machine. As to Mr. Rodgers' assertion about my feeder wearing out, it is no less fallible in that respect than other machinery; but I have over 250 now in use, some of them for over two years, and have never had to expend 25 cents for repairs. The fact that my feeder received the premium at the late Mechanics' fair, and that I am shipping several feeders weekly to different parts of the country, is sufficient proof of the appreciation in which it is held.

As to my feeders having been thrown out of the Gold Stripe mill, they were not displaced for inefficiency, as the following letter will show, and it answers also as a complete refutation of Mr. Rodgers' statement:

OFFICE SUPERINTENDENT OF THE GOLD STRIPE G. M. CO., )

JOSHUA HENDY, Esq.—Dear Sir:—Your favor of the 15th instant at hand. In reply to your inquiry as to the working of your ore feeders at our mill, we can say that there is no fault in the machines, and we consider them the best now in use. At present they are not in use with us, owing to the construction of the mill, which we are about to rebuild and make proper arrangements for putting in your feeders.

J. K. OWEN,  
Superintendent Gold Stripe Mine.

One of the principal owners of the Gold Stripe and Green Mountain mills is also largely interested in the Plumas National mine, where I have just shipped several feeders, showing the confidence placed in the machine by these gentlemen who have used it.

Now, if Mr. Rodgers is sincere in his belief as to the merits of a rival machine over mine, here is a chance for him to make a thousand dollars easily, if he can get the owners of the machine to lend him one for the trial, which is the only doubtful thing in connection with the matter. Mr. Rodgers' eight months' experience with both machines ought to give him confidence enough in his own convictions to accept the challenge offered to him, or any one else.

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It may be considered as now fully demonstrated, by careful and long-continued experimentation, that the plan upon which a perfect ore feeder must be constructed is that of the *carrier*, and not that of the shaking table. Uniform and accurate feeding is not possible upon the latter plan. The ore must be evenly carried, upon a steadily advancing plane or table, to the line of discharge, and there simply *dropped*. Spasmodic or jerky contrivances will not answer the purpose.

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Again thanking you for your promptness in securing my patent, I remain, obediently yours,  
WM. H. HARRISON.

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An Illustrated Journal of Mining, Popular Science and General News.

BY DEWEY & CO.,  
Patent Solicitors.

SAN FRANCISCO, SATURDAY, NOVEMBER 17, 1877.

VOLUME XXXV.  
Number 20.

## Patent Foot-Power Machinery.

A few years ago comparatively little attention was given to foot-power machinery. Its utility was supposed to be limited to the narrow capacity of the old crank and treadle motion, which had followed down unchanged from the time of the ancient Egyptians. Good mechanics, being well aware of the defects of this old motion in driving machinery, knew that they could not accomplish anything in actual business to pay for the expense of such machines. Some six years ago radically new inventions were offered to those having use for foot-power machinery, and the new foot-powers without dead centers were made successful in actual business. The Barnes foot-power machines made a radical revolution in foot-power machinery. The machines have been thoroughly tested in workshop business, and meet the long felt want of practical foot-power machinery without dead centers, with a positive motion always in the right direction, and with the largest economy of power. In these machines the pressure of the foot can never retard the motion already gained, but, on the contrary, sends more power from the treadle to the work than is possible in any old-fashioned machine. They have no dead centers to pass, and therefore no necessity to press the treadle at exactly the right point, and raise the foot at exactly the right moment. In all the old-style machines the operator must do this or else retard the motion, and often cause it to stop by a wrong pressure. With these patent foot-power combinations, any pressure of the foot upon the treadle, wherever made, always develops a machine motion in the right direction, and always adds to the working power. This great advantage all good mechanics can appreciate. The stroke of the treadle can be made fast or slow. The difficulty resulting from the old motion, with its dead centers, necessitated a heavy balance wheel to carry the motion through the time when the foot could not be pressed down without deranging the action. This difficulty does not exist at all in these machines, so no heavy balance wheel is needed to meet it.

The patent foot-power combination referred to is herewith illustrated in Fig. 1, the parts being shown detached. The wheel A is the only continuously revolving wheel. The wheel B oscillates about once around, and is termed a take-up wheel. C is an oscillating thimble with two straps, which wind on and off by the action of the treadle, and a spring (composed of an upright piece of wood attached to the leg of the machine), and wheel B. E is termed a dog, and connects motion from the thimble C to the wheel A. The thimble C is caused to oscillate by the two straps winding on and off. One is attached to the treadle and the other to the wheel B. The wheel B is acted upon by the wooden spring referred to, which rewinds it, and thus causes the treadle strap to rewind upon the thimble C. The thimble C carries the dog E back and forth, which engages in the wheel A in its forward motion, and, without checking its speed, runs back idle for a fresh hold. By this simple arrangement, and by the effort of an ordinary walk, the wheel A can be driven at the rate of from 800 to 1,200 revolutions per minute. On scroll saws only one continuously revolving wheel, A, is used. For lathes a cone of pulleys is arranged in this wheel and held to a corresponding one on the lathe spindle. The smallest pulley of these cones is three, and the largest eight inches.

Fig. 2 shows this device applied to a scroll saw. The ordinary motion of this machine is from 800 to 1,200 strokes per minute. The motion is obtained by a very plain device, only one continuously revolving wheel being used, to which the arms are attached. The stroke of the pedal can be made long or short, to suit the operator, for high or low speed. The saw leaves the work as smooth as possible. The swing around the blade, under the arm, is 24 inches; blade, seven inches long. The table is made of white ash, arms of hard maple and the frame of cast iron, weighing in all 55 pounds. The revolving wheel runs on a steel arbor. This machine is sold in this city for \$25.

Fig. 3 is a combined scroll and circular saw

and boring machine. Each machine is perfect, neither being subordinated to the other. The owner can put three machines in one, ready for work in either way, in one minute, and each will do its proper work. The foot-pad is adjustable the whole length of the rod to suit any variety of work. The circular saw, while remaining on its maudrel, can be taken at once out of the way when the scroll saw or boring attachment is to be used. The table to the right of saw is mounted on true planed iron ways. On this table the material is placed at any desired angle and moved to the saw with perfect accuracy. The table is adjusted up or down by a screw, to allow any desired depth of cut being made by the saws or cutter tools. This machine is sold for \$40.

Fig. 4 is a lathe with the patent foot-power attachment. The swing of this lathe is nine and three quarter inches, and will take work 30 inches long. No wrench is required to



FIG. 2. FOOT-POWER JIG SAW.

adjust the tail stock or other parts, hand wheels being used instead. The speed can be varied from one revolution to 3,000 per minute at will. It is not necessary to pull the belt to start it in the right direction, for when the treadle is moved it goes at once in the proper way. This arrangement does away with the usual cumbersome frame-work for a treadle, nor does the treadle jar the machine. The lathe-bed is of wood and can be made any length. All the bearings are of steel. The centers are fitted to taper holes. There are three cone pulleys on the machine. The price is \$35.

This machinery can all be seen at the store of Oshorn & Alexander, 628 Market street, in this city, they being agents for this coast. They

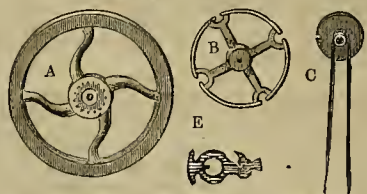


Fig. 1. Patent Foot-Power Combination.

have a great variety of lathes and saws of different styles, run by this same foot-power attachment, and also a large and varied assortment of mechanics' tools of every possible kind.

These machines have proved so successful that the agents are willing to send them on trial and will take them back if not found satisfactory.

MINE PATENTS.—Dewey & Co., of this city, have recently added another important branch to their already extensive mining business, viz: the procuring of patents for mine and mill claims. This firm has facilities for procuring patents that will insure promptness and accuracy, which will be appreciated by Sierra mine owners, many of whom have been sorely annoyed by needless delays in procuring patents. —S. F. Correspondence Mountain Messenger.

## The Mechanic Arts College.

We see that the Regents of the University of California have adopted a plan for the new edifice for the Mechanic Arts College, at Berkeley. Bids will be immediately advertised for, and the contract for the construction of the building will be let and the work prosecuted at an early day. The plan includes a substantial structure of brick and stone, with massive walls, to stand the weight, wear and tear of machinery. The cost of the edifice must come within the appropriation of \$40,000.

It is to be hoped, after this new building is completed, that the Legislature will appropriate sufficient funds to equip it in a manner commensurate with its need. Simply a Mechanic Arts College building amounts to little unless properly equipped. The machinery, tools, etc., requisite will, in all probability, cost considerable

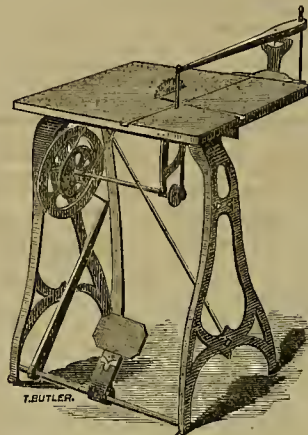


FIG. 3. COMBINED MACHINES.

more than the building; that is if the College has an equipment such as is hoped for. The people of the State must be prepared, however, to spend some money in properly establishing this College if it is to be of any practical utility.

During the past year the University has overflowed with students, but the appropriations have been meager, and business has been conducted on an extremely economical basis. An institution of this character, with a large corps of instructors, is an expensive one to run, but

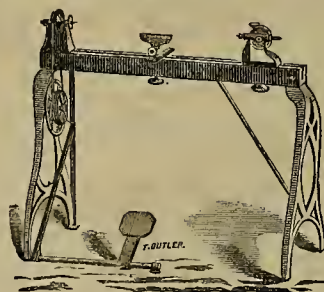


Fig. 4. Foot-Power Lathe.

it is of inestimable advantage to the State. Limited means cause many drawbacks, and increase the labors of the teachers. Many things are required from time to time, which should be purchased, but have to be dispensed with. The Legislature should take into account the importance of the institution, and help it as much as possible.

When the Mechanic Arts College is in full swing there will be no better place in the country to acquire an industrial education; for taken in connection with the Agricultural College, the University of California will offer every encouragement possible in this line. As we stated before, it is to be hoped that the Legislature will deal liberally, not only with the University, but the new College in particular, so that every facility will be supplied to aid the instructors in their several departments.

## Notices of Recent Patents.

Among the patents recently obtained through Dewey & Co.'s SCIENTIFIC PRESS American and Foreign Patent Agency, the following are worthy of mention:

BERRY BOXES.—Chas. W. Weston, S. F. This invention relates to that class of berry boxes in which the boxes are constructed by crossing two or more thin shavings or veneers at right angles to each other and bending their ends upwards and then securing the edges by a sheet metal or other binding. For convenience in transporting the empty boxes it is necessary to make their upper open ends wider than the bottoms, and this is done by flaring the sides outward toward the top of the box, so that any number of the boxes can be nested together. The strips of veneers heretofore used were made with straight edges, so that when the upturned sides were flared, an opening gradually increasing in width from the bottom to the top of the box was formed in each corner. This opening is by some considered objectionable, because the small fruit or berries which were placed in the boxes would get into these openings and get jammed, and the juice would run out over the box and soil the clothes of the person who carried it; moreover, it spoiled the appearance of the fruit. To obviate this trouble this inventor cuts the edges of the top in a peculiar manner. He also provides an improvement in the binding, whereby he is enabled to make larger boxes of this construction, whereas they have heretofore only been made for small fruit on account of the difficulty of making them strong and rigid enough.

"LAZY-BACK" FOR VEHICLES.—John J. New-some, S. F. This is an improved arrangement for attaining a yielding or elastic motion for the lazy-back of a carriage or other vehicle seat. Ordinarily the back is rigidly secured to the back proper of the seat by standards, and the elbows are similarly attached. This invention consists in supporting the rail or lazy-back upon hinged standards and then connecting the elbow at each end to the standard, so as to allow the loose or free motion, while the front end of each arm is mounted on a coiled spring which admits of free action when a strain comes on the back.

HEADING MILL.—David Pomeroy, S. F. The invention relates to improvements in heading mills, and consists in a novel arrangement for feeding the saw table in such a manner that the approach to the saw is slow, to allow the cutting of the timber, while the downward, or withdrawing motion, is made rapidly, thus increasing the capacity of the mill and causing a saving in the labor employed. It also consists in the use of adjustable jaws attached to the saw table for holding the stick of timber to be sawed, which do away with the necessity of using dogs to hold the holt, and allow a rapid feed with little labor.

BULLION SHIPMENTS.—Since our last issue shipments of bullion from the prominent mines have been as follows: Con. Virginia, Nov. 10th, \$238,944.79; Standard, 6th, \$46,291.11; Northern Belle, 5th, \$5,524.85; Arizona, 7th, \$1,335.38; Endowment, 10th, \$2,656.72; Grand Prize, 9th, \$12,500; Leopard, 10th, \$4,700; Modock, 9th, \$5,945.27; California, 10th, \$141,706.97; Northern Belle, 7th, \$5,884.78; Alps, 10th, \$1,800; Raymond & Ely, 7th, \$14,288.48; Northern Belle, 10th, \$7,109.50; Modock, 11th, \$3,411.37; Tyho, 10th, \$8,426.75—total to date, \$27,472.25; Grand Prize, 15th, \$14,700; California, 13th, \$161,508.57; Con. Virginia, 13th, \$59,575.07; Martu White, 10th, \$11,964.97; Arizona, Oct. 30th, \$1,547.23.

GOOD RUNS.—The Sentinel says that one of the Eureka Consolidated furnaces has run uninterruptedly for over 130 days, and two others 100 days, not an hour having been lost during that time, outside of the necessary stoppages. An effort will be made to keep all four in operation during the present month, and relieve them, one at a time, in the month of December. Nos. 1, 2, and 4, will be shut down, each furnace taking about seven days to repair, and in consequence, an average of but three furnaces will be in operation the ensuing month.



## CORRESPONDENCE.

It is the desire of the editors of this journal to be liberal toward all correspondents, and therefore statements and opinions are frequently published, on the authority of the writers, for which we do not assume responsibility.

### The Silver King Mine.

EDITORS PRESS:—In coming from San Francisco to Globe district, Arizona, I laid over a few days at Pioneer district, 35 miles nearer Florence, mainly with the view of taking a general external look at the above named well-known mine. I say "external," for no man, friend or foe to the company, is allowed to examine its internal workings. What the object of this mysterious procedure can be, and what evidences of sagacity may be drawn from the fact that the owners will not permit a visitor, as I was given to understand, even to set his foot on the ore dump, I am unable to say. My memory it may be added however, carries me back to a time in a certain mining district in Nevada, where a man who owned a rich mine took great pains to show it to all comers, but when it unfortunately became barren, he promptly found satisfactory excuses for excluding visitors, and actually succeeded in creating a mystery out of a common-place occurrence. While one's suspicions are naturally excited in regard to the condition of the Silver King mine, I must admit that in the conflicting testimony I was able to gather in respect to it, there is a preponderance favorable to the property, in estimating its present and future value. I was informed by men who worked at the bottom when the last work was done, that there were large bodies of high-grade ore in sight, very little of which was allowed to come to the surface. On the opposite side, men generally well informed, who had been in the district or who had lived in the vicinity of the mine for months, assured me, with equal confidence, that the ore deposit was completely exhausted. This conflict in testimony is the first fruits of the secret policy adopted by the owners, and if they are pleased at this state of things, if they believe they can possess a rich mine and gain benefits from it without the public becoming aware of the fact, or if they imagine they can sell the property to men who are not allowed to look at it, I confess I do not see any reason why they should be taught any sooner than experience will teach them, that there is a practical limit to all such fine little plans.

There has been a difference of opinion expressed, also, in regard to the nature of the rock in which the King mine is found. One gentleman I heard expatiating in San Francisco some months ago, declared that its country-rock was sandstone, just such as grindstones were made of, and that the ore was in an egg-shaped mass, without any evidence whatever of a vein-formation. I saw no sandstone near the mine, and I found on the surface a continuous vein of ore-bearing rock for several hundred feet, about as regular and well defined as lode-croppings are usually expected to be. I do not undertake to describe technically the yellowish colored and rather uncommon rock adjoining the ledge, but may say that there is a formation seen at one point on the eastern side of the Comstock lode, which scientists call porphyry, that unmistakably resembles it. A Comstock miner, looking at the white rock on the Silver King dump, will almost think himself in Virginia City, and until he goes off some distance to the north or south, where shafts are being sunk in harder granite material, he will find nothing that will take the "grindstone" shape.

There have been numerous opinions given, also, in reference to the Silver King mine being a "slide" or a "faulted" body of rock which had come from higher ground, and in respect to its being laid out by the locators as an east and west lode when its true course was really north and south. So far as a careful examination of the surface enabled me to judge, I could see no evidence of such "faulting" as would swing the ledge completely out of its place. The vein is regular, with a southwest and northeast strike, its dip being to the northwest. The locators may not have laid down their surface lines exactly parallel to the trend of the vein, but they are so near the true line that it will be a very extraordinary thing in the future if the Silver King, north, captures a single foot of the original claim, or if the Silver King, south, secures more than a diagonal slice at a considerable distance from its present shaft. As the two extensions named have cost round sums of money, and, withal, are \$10,000,000 California incorporations, it may not please some parties to see this opinion expressed in print, but the truth ought to be told whatever the result may be.

There are two belts of silver-bearing veins in Pioneer district, the one running into the other at no great distance from the Silver King. The latter mine, and the "petered" out Athens claim, as well as others, run northeast and southwest, while the Guanavato, a rich lode recently discovered by the Connolly brothers, is in a belt running south southwest and north northeast, and inclining to the east. The evidences of deep fissuring are very plain in the latter belt, and several very promising mines are found along its course.

If the Silver King mine is only a slide, it must

have come from this belt, which strikes along the western slope of the range several hundred feet above its works. A break from a lode dipping to the east would not be found pitching to the northwest after being thrown at least 100 or 200 feet, without presenting on the surface a loose and shattered appearance, such as is not seen on the King croppings. I do not think that the lode is much out of its place, or that it will be found running north and south with a western inclination, when it would have to belong to a belt all of the ledges in which, even on the surface and parallel to the King shaft, are found dipping to the east.

I see no reason why the mine should cease to be productive. It has yielded in high-grade ores several hundred thousand dollars, and will, I have no doubt, if properly managed, continue to enrich its owners for years to come. In the past it has been very badly managed. Its ores, assaying thousands of dollars to the ton, were thrown into the waste dump, so that after an immense amount of assortment and re-assortment, now going on as has been the case for months past, as much money will be obtained by this means as was originally taken out of the vein when the ore was separated from the waste before being brought to the surface. One man who paid \$15,000 for the right to pick over the dump made \$75,000 out of it, and then sold his right to another, who it is believed will realize about an equal sum. The company is also concentrating the rock rejected by the sorters, and making a handsome profit by the operation.

I had not an opportunity of visiting all the mines of the district, but I saw enough to convince me that, by the effective application of capital, there is a prosperous future for it, and liberal returns to those who skillfully engage in developing its resources.

J. D. E.

Globe City, A. T., Oct. 25th, 1877.

### Forest Hill Mining Items.

The Placer Herald says: The activity displayed by the miners of this section in thoroughly and extensively fitting up their claims in anticipation of a bounteous water season has given quite a stimulus to the town of Forest Hill. Improving and repairing has been the order for some time. A vacant house is not to be found in that town, and business of all kinds is fairly prosperous. The Dardanelles Consolidated company, whose property comprises what was formerly known as the Oro and Dardanelles claims and ditch property, under the superintendency of Mr. Joseph McGilvray, have had a large force of men employed all summer and fall, and have effected some extensive and important improvements. They have cleaned out and enlarged their ditch from head to foot, a work which will materially increase the water supply of that part of the divide. They are now at work on the claim running drifts and fitting up generally for the washing season. In place of the one pipe that heretofore carried water down into the claim, they are preparing to put down two pipes, each 22 inches in diameter. These will carry a large amount of water and will enable them to tear away the bank at an astonishingly fast rate. The gravel in this company's claim is known to be rich, and with their increased facilities for washing it, we may expect to hear of big returns from this source as soon as the water season commences.

Willis Jones is fitting up the Green Spring claim, which adjoins the Dardanelles Consolidated on the east, and intends to work it this winter.

West of the Dardanelles Consolidated, lies the Big Spring claim, owned by May, Pecht & Neuman. This is thought by some to be one of the best hydraulic claims for its size on the ridge. The owners have been drifting this past summer and have made it pay. They propose, however, to wash during the water season, and with this view have put in new pipe and otherwise fitted up their claim in excellent shape.

The Jersey, which lies just under the hill from town, owned by Howell & Co., is a drift claim, and has been operated steadily all summer, yielding, we understand, very fair returns.

At the Young America, owned by Harris & Co., they are at present employing 20 odd men in fitting up and prospecting their claim. Their washing thus far has been, so to speak, on top, and yet it has paid well. There is no telling how rich their ground may be on the bottom, but for the purpose of prospecting it they are now sinking a shaft down to the bedrock.

The Adams brothers have recently bought out Mr. Beswick, out near Brushy. They are fitting up their claim for hydraulicing, and if water should prove plenty this coming winter they will work it by that method. But in the event of water being scarce, as was the case last winter, they will work the claim on the drift plan. The gravel is rich and will pay by either process.

Cranage & Co., at Smith's point, profiting by the experience afforded by last winter, which was a dry one, are also prepared for either hydraulicing or drifting, and like the Adams brothers, will do the one or the other, according as the winter shall be wet or dry.

Mr. Arthur, whose claim is also near Smith's point, discouraged by losing last season's time, owing to the lack of water, commenced to drift last summer and has made it pay. He has taken no pains to fit up for hydraulicing, determined to keep on drifting until assured of plenty of water.

The Sebastopol, owned by Fox & Co., is a cement drift claim, the material from which has to be put through a mill process in order to give up its gold. For want of water they have been

able to run the mill only a few hours a day recently, but when the rainy season fairly sets in and water becomes plenty, they will run steadily and make it pay.

Wm. Borland, near Smith's point, continues steadily at work in his drift claim. He is now in over 1,000 feet. His gravel is good and growing better. His prospects are such as to indicate that he is opening up one of the best claims on the divide.

Breece & Wheeler have their celebrated hydraulic claim at Bath all fixed up in good shape, ready to commence washing as soon as the water supply is sufficient. We might mention, right here also, that Mr. Breece has just completed one of the finest dwelling houses in the mountains, at a cost, it is supposed, of but little less than \$10,000.

Grinnell & Ford have been opening up a new claim in Lady's canyon, and are ready to commence operations whenever the water comes. They have a location that promises to prove rich.

Burt & Dewey are taking good paying ore from their quartz mine at Bath, and keep their mill running nearly all the time.

Hosmer & Co. have their tailing claim in Volcano canyon ready for the winter's run. This claim consists of a bed of gravel some 30 or 40 feet deep that has collected mainly from the rich mines above it, and is quite rich.

Wm. Lee, whose claim is in Volcano canyon just below Hosmer & Co.'s, is of a similar character, and pays well. Mr. Lee has been sluicing pretty much all summer, utilizing the water that flows down the canyon, and has made it pay. He is now making preparation for more extensive operations this winter.

From the foregoing it will be seen there is much vitality yet in the mining interests of Forest Hill and vicinity. The preparations for the winter's work are indeed more extensive and thorough than for years before, and a fact that indicates a recuperation of our mining interests, the result of increasing confidence in the richness of Placer county's gravel deposits.

### Prescott and Vicinity.

There are fewer idlo men in Prescott than in any town on the coast. The demand for labor to develop the newly discovered bonanzas, and the increased forces put to work on the older mines, have taken almost all the floating population. The erection of new quartz mills in every section of the county has given an additional impetus to prospecting, and the extent of country being explored is wonderful. The number of claims recorded will average about 20 per week. All the mining camps are filling up, and our merchants are seizing the opportunity to establish branch stores at the different towns, thus showing that they too have faith in the future prosperity of the country.

The Humboldt district is panning out well. The Tip-top and other mines are yielding larger quantities and richer ore than ever. As soon as the new mill is completed and in running order, this district will turn out an amount of bullion that will belie its name.

Peck district still holds up to its former standard, although the Tip-top excitement withdrew the attention of the public for a short time, but the near completion of the new 20-stamp mill for the Peck mine, and the fact that the company ship at least \$3,500 worth of bullion every other day, assures us that the owners have the bonanza of the district. The Black Warrior, also in this district, is showing up unusually well, and the company is taking out a quantity of very rich ore. Some specimens in town the other day show rich in native silver.

In Turkey Creek district everything is rushing. Masterson's mill will soon be ready, and will make its first run on 50 tons of Goodwin ore. The Black Warrior company have contracted with Mr. Masterson to have 40 tons of ore from their mine worked after the first clean-up. The Turkey Creekers now have as complete a silver mill as there is in the Territory, and are not going to be slow to take advantage of it. Great activity is displayed at all the mines and a very large amount of rich ore is being taken out.

Already the effect of this activity is being felt throughout the county, and is drawing the attention of California and Eastern capitalists this way. New companies are being organized in San Francisco, almost every week, to work some of the numerous rich mines in this Territory, and the day is fast approaching when Arizona will rank foremost among the "Silver States."—*Arizona Miner*.

PERSONAL.—We are grieved to learn of the death of William Henrici, at his home in Pennsylvania. Not long since we took leave of him and bade him God speed upon his journey to recover his lost health under his mother's care. The journey was too much for his diminished strength, and he was unable to rally from its effects. He is sincerely mourned, and his memory will be fondly cherished by his associates in our establishment, where he discharged with unusual skill and fidelity the difficult work of proof reading. We esteemed him for his gentlemanly bearing, and for the upright manner of his life, and we can assure his Eastern friends and relatives that his course among us was such as to reflect honor upon those from whom he came hither. He is gone but will not be forgotten.

### Mining Affairs at Eureka.

The Eureka Sentinel says: Outside districts, as everything off of the Comstock were at one time contemptuously called, are beginning to take front rank among mining localities, and this is especially true in regard to this portion of eastern Nevada. A locality that sends forth a stream of bullion aggregating monthly over \$500,000, and keeps up a steady stream of production at that rate uninterruptedly, cannot be pished and pshawed down by all the stock sharps that ever congregated on California street, and its merits are too patent not to be recognized by the veriest doubter that ever pretended to a knowledge of the resources of this favored land. Notwithstanding all the drawbacks that has attended base metal mining, and the depressions incidental to all mining communities, we can point with some degree of pride to the fact that Eureka district has contributed \$40,000,000 to the wealth of the world since its discovery, and this amount has been taken out during the last eight years. Another, and more gratifying fact in connection with our resources, is that at the present time our prospects are brighter than at any former period in our history.

The older mines are developing new and larger bodies of ore in the deeper workings, deposits that outrank in size and magnitude the surface bonanzas that made them famous, and new locations are being daily developed, giving promise that they will equal the older properties in yield and value.

#### Active Operations.

There is renewed activity all along the line. Mining experts flit to and fro, between Eureka and San Francisco, examining properties and reporting to their employers, and the owners of claims, confident of the merit of their respective mines, ask prices therefore, and readily obtain them at figures that would have been looked upon as enormous at an earlier date. There has been no notable operations during the week. The usual amount of ore has found its way to the furnaces, and the fumes pouring from the tall chimney stack are evidences of continued prosperity. The amount of work being done at present, affects all classes favorably, and every one benefits by the lively season now at hand. We made a computation last week of the number of miners and furnace men employed in the district, the total reaching 1,100. Taking this as the total number, and averaging their wages at \$4 per day, we find that from this source, coin to the amount of \$132,000 is monthly disbursed to this class, the money finding its way into general circulation and stimulating every branch and artery of trade.

The present consumption of charcoal will amount to an average of 10,400 bushels daily, or 312,000 bushels a month. The companies pay for this fuel an average of \$80,000 per month, every dollar of which is a direct contribution to a home industry, and is retained within our borders. Taking into consideration wood, timbers, and mining supplies, the amount of cash disbursed monthly, that finds its way into home channels, will not fall short of \$250,000, which we submit, is a very respectable sum, and an evidence that we are on the top wave of prosperity.

### Copperopolis and Vicinity.

From Thomas McCarty, Esq., of the old Log Cabin ranch near Copperopolis, we learn that a San Francisco company have purchased a quartz ledge, situated about two miles west of Copperopolis, and work is being prosecuted with vigor, Henry Botcher Esq., is the superintendent of the mine. It being ascertained to a certainty that the lode is a good one, a contract has been entered into to erect a quartz mill for the company, and crushing will be commenced as soon as the mill can be completed.

The Eagle mine formerly known as the old Quail Hill mine, one mile west of Telegraph City, is being worked, and large quantities of quartz have been taken out. The quartz from this mine is said to contain quite a large percentage of superior nickel.

Messrs. Saunders and Little have leased the old Napoleon mine situated one and a half miles south of Telegraph City. They are working the mine by the lixiviating process. Bluestone is also made by this same process.

The times around this section of the State are improving, and it is to be hoped that Copperopolis will once more be the important mining center that it was several years ago.—*Advertiser*.

THE TRANSPORTATION OF PETROLEUM IN VESSELS.—The Kingston British Whig, of October 5th, says: "An oil tank vessel, designed for the oil trade between Sarnia and Montreal, has just been completed. Some 85,000 pounds, or 42 tons of iron, have been consumed, and the tanks, of which there are six, three on each side, will carry about 400 tons of oil. It is the intention, we believe, to have two more tanks made to lie on the deck of the schooner to make her deep enough to sail down the lake. These will be lighted here. The capacity of the six tanks will be nearly 114,000 gallons, and the total, when full loaded, about 150,000 gallons.

LANDER HILL AHEAD.—At the Nevada State fair held at Reno recently, a specimen of ore from the Manhattan mines took the premium for exhibits of silver ores. Lander Hill ores are the richest in silver and the most showy of any produced in Nevada.



## MECHANICAL PROGRESS.

## Improved Method of Drilling for Petroleum.

As many of our readers are interested in developing the petroleum resources of the lower counties of our State, we compile from a Pennsylvania exchange the most approved method in that oily State. The system of drilling now in vogue is a great improvement on that pursued a dozen years ago in the use of "casing" to shut off the surface water. The surface wells, 300 or 400 feet deep, put down from 1861 to 1864, were drilled about two and a half inches diameter, with a set of tools weighing about 300 pounds, attached to a "spring pole," with a derrick about 25 or 30 feet high, operated by two men; the spring pole being something like the pole of an old-fashioned well, and 15 or 20 feet per day was considered rapid progress. As the weight of the tools, the diameter and depth of the well was increased; horse power and afterwards steam power was substituted for the "spring-pole." With the present system, a derrick of 65 to 75 feet high is first put up; steel-edged cast-iron driving pipe, eight inches internal diameter, is then driven through the surface soil until it rests on solid rock; then a hole, eight inches diameter, is drilled with tools, weighing about 2,000 pounds, to a depth below the surface, varying from 150 to 500 or more feet, when a "casing" of light iron pipe, six inches internal diameter, is lowered down and rested in the rock and the holes continued down, five and a half inches diameter, until oil is struck or a depth usually sufficient to reach it in that region has been attained. When the well is tubed and pumped for a reasonable length of time; if no oil is yielded, some torpedoes are exploded in it, in order to open up communication with crevices containing oil, if possible, and if no oil is then obtained it is abandoned. Sometimes the elastic force of the confined gas is so great that upon striking the crevice containing it, it forces the tools out and the oil commences to flow without pumping; at other times pumping may be required for a few days or continuously. With the heavy tools now in use, 70 feet per day is sometimes averaged. In the old method of boring without casing, the hole was kept full of water, which followed the drill down, exerting a pressure of over 300 pounds per square inch at a depth of 700 feet, which the gas must overcome before the oil would flow spontaneously, and in many cases is supposed to have driven the oil into other channels before the pump was put in, sometimes even flooding another well at some distance which had been yielding oil. By using casing these risks are prevented, as the surface water is prevented from reaching deeper portions of the well. As the tubing and casing are withdrawn from abandoned wells, they should be required to be plugged below the surface water-veins, otherwise the producing wells of the district will sooner or later be ruined by being flooded with surface water or the escape of gas.

**A NEW MAIL CAR.**—The postoffice authorities have been greatly aided by inventors in devising means to enable them to do the quick work necessary on the flying postoffices on the railroads. We read that a new and improved mail car has just been completed by the Chicago, Milwaukee and St. Paul Railroad Company for use on their road, the car having been constructed in Milwaukee by Mr. Bailey, master mechanic of the road, from plans furnished by Captain J. E. White, Superintendent of the railway mail service, sixth division. It is 50 feet in length, and has 12 wheels, carried under two patented trucks. It is fitted with Miller platforms, and the improved Westinghouse automatic air-brake. The principal improvements are, first, the increased space given; second, the new arrangement of the mail bags, whereby the distribution is facilitated; and third, the increased light and superior accommodation for the distributing clerks. In the old cars the papers were distributed into a semi-circular case, which occupied a full half of the car and admitted light from one side only. Now the bags are carried on iron racks and rest on the floor, while the letters are sorted into pigeon-holes at one end of the car. It is estimated that fully 50% more mail matter can be handled under the new arrangement within a given time than was possible in the old cars, and that the clerks can attend to this extra business with less trouble than they formerly could. A second car will be completed within the next two weeks, the cost of the two being less than \$10,000.

**MEASUREMENT OF WATER SUSPENDED IN STREAM.**—P. Gazi, in view of the difficulties introduced into calculations of boiler efficiency by foaming or other mechanical suspension of vapor, has described an apparatus for determining the degree of humidity, as well as for finding the density, either of saturated or of dry steam, at high pressures. His invention was suggested, in part, by the recent investigations of Hiru, Leloutre and Hallauer.

**A BRIDAL CAR.**—We are pleased to learn that the Cincinnati Southern railway has determined to place a "bridal car" on its line—a luxury which we are assured will supply "a felt want" in that section of country.

## Warming the Piston.

The use of the steam jacket, remarks the *American Manufacturer*, in connection with the cylinders of steam engines and the advantages attendant thereupon are well known, but the diagrams taken by the dynamometer show that a large amount of condensation still takes place; a portion of the condensed steam in the cylinder is evaporated anew during the expansion and another very important portion is also evaporated; but by taking the heat from the surrounding parts of the engine, thus causing a rapid cooling of such parts; those parts which are immediately surrounded by the steam jacket are instantly reheated; but those parts which are not so surrounded, such, for instance, as the piston and rod, are relatively cold on the arrival of the steam in the cylinder, and they therefore condense a large portion of it before they arrive at the same temperature as the steam which flows in. The object of the invention of Madam Veuve Andre, of Thann, Alsacia, is to avoid this latter condensation, such object being attained by forming the piston and piston-rod hollow; the spaces in the two parts being made to communicate with each other. Steam is introduced into the piston and rod through a pipe which is attached to the piston and passes through a stuffing box in the end of the cylinder. This pipe slides in a steam supply-pipe, which is provided with a stuffing box, and has an inlet for the admission of steam and an outlet for the condensed steam. The outlet may communicate with a pump to draw off the condensed steam.

**USING OLD RAILS FOR CAR SILLS.**—Mr. Geo. Richards, the Master Mechanic of the Boston and Providence railroad, says the *National Car Builder*, has recently built two gondola cars in which old steel rails are used for longitudinal sills. He also contemplates building a flat car for carrying lumber and a merchandise box car upon the same plan. Four 30-foot rails, weighing 57 pounds to the yard, are used in each of the two cars already built. They are placed tops down, with strips of plank bolted to their flanges as a foundation for the floor. The bolts are three feet apart, and the floor planks are spiked to the strips in the usual way. The transom timbers are bolted to pieces of iron riveted to the web of the rails and bent around underneath their reversed tops, so as to secure a complete bearing from floor to transom. The end sills are of oak, in which recesses are made with pocket castings inserted in them for the reception of the rail ends. These are held to the sills by forked bolts riveted to the web of the rails, and passing through the sills and castings. There are four longitudinal truss rods 1½ inches in diameter. The drawing attachments are put in as easily and as cheaply as in a wooden floor-frame, and the entire construction is quite simple and free from difficulty. One of the completed cars weighs 17,270 pounds, and the other 18,750 pounds, with sildings, and they have carried 34,630 and 43,550 pounds of coal respectively. Their length over end sills is 30 feet 11 inches.

**CASING SHAFTS AND GEARS.**—Many suggestions have from time to time appeared upon the subject of preventing or lessening the liability to accidents arising from the entanglement of some portion of a workman's garments in a swiftly revolving shaft, such accidents, as is well known, being lamentably common. The *American Manufacturer* says that one of the simplest methods, it would seem, of rendering these casualties impossible, without involving the necessity of constructing a railing or fender about the moving piece in dangerous places, is to cover the shaft with a loose sleeve along its entire length. This may be made of sheet-iron or zinc, and should be movable if desired; it should also be covered within, and at the ends, with leather, to prevent noise. Arranged in this manner, the friction between it and the revolving shaft will be sufficient to cause the sleeve to rotate with the latter; but in the event of any decided resistance being brought to bear upon it, as in the case of the entanglement of an operative's clothing, the sleeve will at once be brought to rest and permit of its extrication without serious injury. The same plan of loose covers is of course applicable to cog-wheels or pulleys.

**WROUGHT IRON WHEELS.**—The object of the invention of Mr. L. Schwartzkopf, of Berlin, is to make the nave and the spokes of wrought iron wheels, especially for railway carriages, without any weld and out of a single bloom. For this purpose he uses a mold of cast iron or other suitable material consisting of two parts, each part having on its face the half mold of the nave and spokes to be produced. Moreover, the upper part has in its center an opening about the diameter of the nave, and of a length sufficient to contain the bloom out of which the nave and spokes are to be made. The two parts of the mold are firmly bolted together and placed under a powerful hydraulic press connected to an accumulator or other arrangement for storing up water pressure. A bloom of proper size, to which a welding heat has been given, is then thrown into the aforesaid central opening of the upper part of the mold, and by means of the hydraulic press, a piston is made to enter into this opening, thereby pressing or squeezing the material of the bloom during its soft state into all the cavities of the mold, so as to complete the nave with the spokes at a single operation. The parts of the mold are then separated, and the finished piece is taken out.

## SCIENTIFIC PROGRESS.

## New Edible Fungi.

At the last meeting of the San Francisco Microscopic Society, as reported by the Secretary, Col. Kinne, Mr. J. P. Moore furnished the Society with the following technical descriptions of two new fungi found on this coast with remarks concerning them. The *Tremella* he speaks of, might be cultivated and cut up into steaks for a good-sized family, which would be an object these hard times. Messrs. Moore and Bigelow seem to have eaten it, enjoyed it and both live.

*Agaricus (pleurotus) nemorosus*, (N. S.p.) Pileus.—At first slightly campanulate, then in age, expanded and slightly depressed at center; cuticle thick, separable, pale yellow, and broken up into deep angular scales, which in many cases overlap each other; edge incurved; flesh thick and solid, nearly white, not changing in drying; hymenophoriform confluent and homogeneous with stem.

Gills.—Crowded, deep, coriaceous, adnate or slightly decurrent, much laciniate, pale, straw-colored, and at the edge quite farinaceous, giving a pure white color.

Stem.—Eccentric, firm, solid, tapering downward; upper portion slightly striate; dingy white; 4-6 high; rooting cuticle separating.

This fungus grows mostly on dry, exposed, rocky hillsides, among sage brush, Gold Hill, Nevada, Pileus from 3-4 broad, and readily recognized by its very deep area or scales, into which it breaks up. It has a marked and agreeable odor of decaying wood. Taste, sweetish, resembling liquorice. The whole plant, on drying, retains its color and becomes very hard, almost of a woody texture.

*Tremella fruticulosa*, Fr.—"Caespitose very large even, pallid yellow, base plicate, lobes gyroso-undulate." The above is the description as given by Fries. The specimen which I have was presented to me by Mr. H. H. Bigelow, an enthusiastic collector of fungi. Its size is about two feet by 18 inches, and from six to eight inches thick. When young it is of a pinkish yellow. Its taste and smell are both agreeable. I do not find that the *Tremellini* are put down as edible, but, on trial, I find that this makes an excellent and savory dish when young. No injurious effects were perceptible. There seems to be, however, a slightly exhilarating tendency to it. I wish that those who have experimented with this order would give us their results.

**PRESERVATION OF THE YELLOWSTONE PARK.**—In the *Tribune* report of the Nashville meeting the American Association of the Advancement of Science, it was mentioned that a series of resolutions had been passed with reference to measures for the preservation of the natural curiosities of Yellowstone park. The Secretary of the Interior is charged by law with the maintenance of that reservation as a National park, but no provision has been made for carrying out the intent of the law. The American Association will petition Congress to take active steps to prevent further destruction of the natural curiosities of the park, as their loss would be irreparable, and they have a value to science as a means of settling some open questions. The committee having the subject in charge consists of Prof. Joseph Henry, O. C. Marsh and Theodore B. Comstock, Maj. J. W. Powell and Lieut. George M. Wheeler. The first meeting of the committee will probably be held within a short time, at Washington. It is to be hoped that the measures for preserving the beauties of the park from the ravages of tourists, will be taken before the devastation is complete.

**ON THE TOP OF THE ANDES.**—*La Nature* hears that Mr. Wiener has ascended Mt. Illimani, one of the loftiest if not the most lofty of the Bolivian Andes. This mountain presents a beautiful aspect from the village of La Paz. According to the authority of M. Pentland, it has an altitude of 7,300 metres. M. Wiener has given it an altitude of 6,000 metres; M. Mehin estimates at 6,400. If these figures be exact, M. Wiener has made the highest ascension ever made in the Andes, in fact anywhere outside of Asia; here it has been surpassed by M. Johnson, who arrived at a height of 6,800 metres at the Kingdom of Cachemire, and Mm. Schlagintweit, who in 1855, ascended 6,766 metres in the Himalaya. Ascensions by means of balloons have of course exceeded these figures. M. Glaisher arrived at an altitude of 8,800 metres, and M. G. Tissandier, in the company of Sivel and Croce Spinelli attained 8,600 metres.

**THE JUMPING BEAN OF MEXICO.**—At the last meeting of the San Francisco Microscopic Society Mr. Henry Edwards stated that the so-called "jumping beans" of Mexico, which had been handed him at a previous meeting, had developed a beautiful moth of the family *Tortricidae*, and he would soon be able to report as to whether it was a new species, which he thought very probable. He stated further that this proved to be one of the few instances in which the *Lepidoptera* encroached on the vested rights of the *Coleoptera* in the way of piercing the seal capsules with their ovipositors and laying an egg which, when hatched, destroyed the seed, as the curculio and kindred insects are wont to do.

## Some New Minerals.\*

We gain from the *Polytechnic Review* some notes on new minerals described by European authorities: *Uranocircite*, phosphate of baryta and uranium resembling antinite, for which it was long mistaken, occurs in quartz veins in the granite of Falkenstein, Saxon-Vogtland. *Synrocobalite*, occurs in spheroidal forms with roselite at Schneeberg, Saxony, structure coarsely radiated, rhombohedral, in microscopic crystals. Color, peach-red; H=4; sp. gr. 4.02-4.13; blackens on ignition in closed tubes. Dissolves in warm hydrochloric acid with effervescence, compactive carbonite of cobalt.

*Szuikit* is a new sulphate of manganese. This mineral is amorphous, forms stalactitic aggregates having an uneven fracture. H.=1-5, G.=3.15. Color, a dirty white and a reddish white where newly fractured. If a new surface be exposed for several days to a moist atmosphere, it is turned to an intense red, and an increase in weight is noticeable. Two analyses made of this mineral, the one by Albrecht Schrauf, and the other by Dietrich determine the formula as being Mn. So 4 + H 2o. This mineral was found in notable quantity in an abandoned mine in Felsobanya. It is named in honor of Szmit, the counsellor of mines.

**PHOTOGRAPHING COLORS.**—Joseph Albert, according to the *Vienna Press*, has finally succeeded in inventing photography to render the natural colors in the picture by a photographic steam press of his own construction, without the aid of a pencil. I have seen some of the proofs of such colored photographs by the Albert press. An expert painter could hardly give the colors of the object more faithful in living reality and with a distinctness to the nicest shades. The secret of the invention consists in the analysis of the white light into the three colors—yellow, blue and red—and in their recovery of the three colors ready for the press. On a plate, chemically prepared, so as to receive but the yellow parts of the light, and the tones of the colors of the object to be reflected, the first photograph is taken, when a negative of that plate is at once put under the press, whose cylinder is dubbed over with yellow paint. None but the tones of the yellow colors are now seen in the impression. After that the object is photographed on a plate made to reflect but the blue colors. This plate now under the press reflects a blue impression, the cylinder being dubbed over with blue paint. In the same manner he receives but the tones of the red colors by means of a third plate. Printing the individual pictures of a yellow, blue and red, over each other, a picture is produced true to nature, the colors intermixing by having been printed over each other. The idea, long entertained and prosecuted by Albert, to photograph colors, may no longer be considered as not feasible. It is hard at present to foretell what revolution the new invention will produce in the many departments of art.

**THE AIR AS A GEOLOGICAL AGENT.**—In a foreign publication we read as follows; An all-powerful geological agent is the atmosphere we breathe. Without its aid we should know never a stratified formation. The earth would simply form a ball of truly primitive rock, resulting from the cooling down of the original nebulous mass set apart for our globe, the only variation in which primeval and perennial crust being that of the different strata of higher specific gravity towards the interior. We should have no coal, no metalliferous deposits, no rivers or seas, and no rain—consequently no denudation by "rain and rivers"—for the vapor of water could not ascend into empty space. We should have—but, last and worst of all, there would be no "we." Life would be impossible, and the earth would finally degenerate into a "pale-faced moon." That this is probably her ultimate mission cannot be denied. The only consolation is that owing to her larger size, and therefore slower rate of cooling than the moon, she will have gone through a somewhat more extended geological course. There is undoubtedly a very intimate connection between secular cooling and withdrawal of atmosphere, for the cooler the interior the smaller will be the return of gaseous elements to the surfaces; and probably before Saturn and Jupiter have cooled down to a habitable temperature, the senescent earth will roll through space—cold, void and airless. Sooner or later nothing is more certain than that—"to this favor she must come."

**NOTE ON CADMIUM.**—The uses of metallic cadmium, says a writer in the *Journal of Chemistry*, are limited to the manufacture of alloys having low melting points. One of these alloys, known as "Wood's fusible metal," melts at 70° C., and consists of

Cadmium.....	3 parts or 2 parts.
Tin.....	4 parts or 2 parts.
Bismuth.....	15 parts.
Lead.....	8 parts or 1 part.

A spoon made of this alloy, when placed in boiling water, will melt like wax. By varying the proportions, alloys may be obtained having any required melting points, and may be used as safety plugs on steam boilers. Wood's alloy is also used in taking impressions of objects and making molds. An amalgam of cadmium is sometimes employed by dentists for filling teeth.



## Table of Highest and Lowest Sales in S. F. Stock Exchange.

Name of Company.	Week Ending Oct. 25.	Week Ending Nov. 1.	Week Ending Nov. 8.	Week Ending Nov. 15.
Alpha.....	15	12	11	10
Alta.....	101	74	81	86
Andes.....	1	80	85	80
Baltimore Con.....	1	10	5	5
Belcher.....	61	5	5	5
Best & Belcher.....	23	20	18	15
Bullion.....	12	10	8	8
Caledonia.....	33	23	23	23
Challenge.....	36	3	1	1
Chollar-Potosi.....	36	3	3	3
Confidence.....	61	8	4	4
Con Imperial.....	15	80	85	80
Con Virginia.....	34	30	27	24
Crown Point.....	61	5	5	5
Coso Con.....	15	80	85	80
Dayton.....	47	43	46	44
Deechequer.....	12	10	9	4
Edwards & Bertrand.....	20	13	11	11
Gen Thomas.....	20	13	11	11
Gold Frize.....	1.35	1.40	1.40	1.40
Globe.....	1.35	1.40	1.40	1.40
Golden Chariot.....	25	40	45	45
Gould & Curry.....	1	81	81	81
Hale & Norcross.....	8	7	6	6
Hussey.....	75	45	40	40
Julia.....	3.10	2.15	2.10	2.20
Justice.....	14	12	10	10
Kentuck.....	7	3	3	3
Knickerbocker.....	9	7	6	5
Kossuth.....	35	25	25	25
Lady Bryan.....	31	3	3	3
Lady Wash.....	1.30	1.03	1.00	1.00
Leopard.....	1.30	1.03	1.00	1.00
Leviathan.....	60	55	50	50
Leeds.....	1.35	1.50	1.50	1.50
Manhattan.....	13	11	11	11
Mansfield.....	50	45	40	40
Meadow Valley.....	40	35	30	30
Mexican.....	12	10	8	8
North Con Virginia.....	65	50	40	40
New York.....	65	40	30	30
Niagara.....	1.40	1.30	1.15	1.15
Northern Belle.....	1.10	75	90	45
Occidental.....	11	11	11	11
Ophir.....	18	16	12	12
Overman.....	25	19	17	14
Pacific.....	25	19	17	14
Potosi.....	25	19	17	14
Panther.....	90	45	60	50
Poorman.....	55	50	50	50
Prospect.....	55	50	50	50
Rand & B.....	10	9	7	8
Rock Island.....	30	20	15	40
Sage.....	103	8	8	8
Seg Belcher.....	43	37	35	31
Sierra Nevada.....	2.35	1.60	1.40	1.40
Silver Hill.....	3.90	2.90	2.55	2.55
South Chariot.....	1.40	1.40	1.40	1.40
Succor.....	1.40	1.40	1.40	1.40
Trojan.....	1.40	1.40	1.40	1.40
Union Con.....	1.40	1.40	1.40	1.40
Wells Fargo.....	1.40	1.40	1.40	1.40
Woodville.....	1.40	1.40	1.40	1.40
Yellow Jacket.....	1.40	1.40	1.40	1.40

## Sales at S. F. Stock Exchange.

Friday A. M., Nov. 9.	Saturday A. M., Nov. 10.
470 Alpha.....	12@12
1400 Andes.....	11@11
200 Best & Belcher.....	21@21
300 Belcher.....	51@51
1015 Bullion.....	61@61
200 Confidence.....	51@51
300 Chollar.....	51@51
1885 California.....	23@23
805 Con Virginia.....	27@27
1235 Crown Point.....	51@51
1700 Con Imperial.....	60@60
1700 Caledonia.....	60@60
2400 Exchequer.....	4.80@4.80
1480 Gould & Curry.....	1.40@1.40
2895 Hale & Norcross.....	81@81
1980 Justice.....	2.20@2.20
300 Kentuck.....	6.25@6.25
2325 Mexican.....	15@15
1520 Ophir.....	1210@1210
1020 Overman.....	30@30
700 Succor.....	30@30
680 Savage.....	91@91
2410 Sierra Nevada.....	5.00@5.00
2315 Union Con.....	14@14
1140 Yellow Jacket.....	10@10
AFTERNOON SESSION.	
50 Argenta.....	1.70@1.80
840 Alps.....	2.25@2.25
1630 Andes.....	21@21
815 Bullion.....	61@61
2500 Belle Isle.....	1.30@1.30
1400 Baltimore Con.....	1.10@1.10
300 Boyle.....	5.00@5.00
330 Best & Belcher.....	51@51
300 Benton.....	1.60@1.60
210 Bodie.....	3.00@3.00
385 California.....	2.25@2.25
240 Con Virginia.....	2.00@2.00
40 Chollar.....	3.00@3.00
380 Crown Point.....	51@51
200 Coso Con.....	5.00@5.00
1000 Chromer.....	2.20@2.20
100 Day.....	1.10@1.10
2000 DeFrees.....	1.10@1.10
300 Dayton.....	4.00@4.00
540 Exchequer.....	4.80@4.80
540 Eureka Con.....	4.00@4.00
100 El Dorado S.....	1.10@1.10
1130 Gould & Curry.....	9@9
1000 Grand Prize E.....	8.50@8.50
1485 Grand Prize.....	12@12
50 Gila.....	1.10@1.10
1275 Hale & Norcross.....	71@71
1950 Hornet.....	30@30
200 Hussey.....	4.00@4.00
1200 Independence.....	4.00@4.00
530 Justice.....	9@9
875 Jackson.....	3.00@3.00
300 Jose Scates.....	4.50@4.50
320 Leeds.....	2.20@2.20
700 Lady Wash.....	4.15@4.15
250 Leviathan.....	4.00@4.00
2750 Mexican.....	1.30@1.30
1200 Modoc.....	1.30@1.30
30 Manhattan.....	1.20@1.20
130 North Con Vir.....	1.75@1.75
170 Northern Belle.....	1.15@1.15
2515 New York.....	2.40@2.40
840 Nevada.....	7.00@7.00
300 North Carson.....	3.00@3.00
300 Ophir.....	2.80@2.80
165 Overman.....	1.70@1.70
140 Phenix.....	1.50@1.50
700 Panther.....	3.00@3.00
85 Raymond & Ely.....	8.00@8.00
720 Rye Patch.....	4.90@4.90
1350 Silver Hill.....	1.40@1.40
1000 Silver King.....	2.80@2.80
1160 St Louis.....	2.00@2.00
250 Solid Silver.....	4.25@4.25
110 Senator.....	3.00@3.00
800 Star.....	3.00@3.00
1235 Trojan.....	1.30@1.30
100 Tiptop.....	1.10@1.10
50 Woodville.....	1.10@1.10
310 Ward.....	7.00@7.00
450 Yellow Jacket.....	10@10

110 Gila.....	14@13	420 Overman.....	17@18
400 Hussey.....	3.50	15 Raymond & Ely.....	8.00
500 Hornet.....	3.00	450 Silver Hill.....	1.40
600 Independence.....	1.10	3780 Silver King.....	2.80
1880 Julia.....	2.35@2.35	300 South Justice.....	1.00
350 Jackson.....	3.15@3.15	100 Senator.....	3.00
1150 Justice.....	1.00@1.00	50 Silver King.....	3.00
100 Kossuth.....	4.00	60 Star.....	3.00
150 Leeds.....	2.60	140 Silver Prize.....	1.00
160 Leopard.....	1.45@1.45	775 Trojan.....	1.20@1.20
750 Lady Wash.....	7.00@7.00	930 Union Con.....	7.00
925 Leviathan.....	4.00@4.00	415 Woodville.....	1.10@1.10
1100 Modoc.....	1.35@1.35	350 Wells Fargo.....	6.00@6.00
65 Manhattan.....	1.10@1.10	165 Ward.....	8.00@8.00
530 Navajo.....	1.45	100 Young America.....	5.00
2970 New York.....	1.15@1.15	Wednesday A. M., Nov. 14.	
290 Northern Belle.....	1.15@1.15	680 Alpha.....	11@12
20 Occidental.....	1.53@1.53	300 Belcher.....	51@51
2220 Ophir.....	30@30	505 Best & Belcher.....	17@17
50 Rock Island.....	2.00	250 Baltimore Con.....	1.60@1.60
225 Raymond & Ely.....	8.00	900 Bullion.....	61@61
260 Rye Patch.....	4.95@4.95	110 Challenge.....	1.00
200 Silver King.....	1.23@1.23	12350 California.....	2.70@2.70
700 Silver Prize.....	1.00@1.00	285 Con Virginia.....	2.30@2.30
745 Silver Hill.....	2.20@2.20	500 Union Point.....	3.00
300 South Justice.....	1.00	160 Chollar.....	3.00
350 Solid Silver.....	3.75@3.75	300 Con Imperial.....	9.50
475 Star.....	2.24@2.24	2440 Caledonia.....	4.35@4.35
1600 Trojan.....	1.30@1.30	1100 Confidence.....	3.50@3.50
400 Wells Fargo.....	6.00	500 Dayton.....	4.00
100 Ward.....	7.00	605 DeFrees.....	1.10@1.10
150 Woodville.....	1.10	770 Gould & Curry.....	5.00
120 Yellow Jacket.....	1.10	1275 Justice.....	11@12
Thursday A. M., Nov. 15.		1115 Alpha.....	11@11
190 Alpha.....	11@11	1150 Julia.....	2.20@2.20
1115 Alpha.....	14@14	795 Kentuck.....	51@51
455 Belcher.....	5.00@5.00	1235 Mexican.....	2.25@2.25
1000 Chollar.....	3.00@3.00	300 Ophir.....	2.80@2.80
725 Best & Belcher.....	17@17	1610 Overman.....	2.10@2.10
900 Con Imperial.....	8.00@8.00	1070 Silver Hill.....	2.70@2.70
1350 Con Virginia.....	2.40@2.40	300 Succor.....	3.00
750 California.....	2.70@2.70	350 Savage.....	9.00
1010 Crown Point.....	1.35@1.35	4.65@4.65	
855 Caledonia.....	3.65@3.65	315 Utah.....	1.30@1.30
90 Chollar.....	3.30@3.30	1100 Union Con.....	7.00
165 Confidence.....	1.17@1.17	500 Yellow Jacket.....	10@10
500 Dayton.....	4.00	2000 Argenta.....	1.60@1.60
975 Exchequer.....	5.00	300 Amazon.....	5.00
875 Gould & Curry.....	5.00	400 Andes.....	6.00@6.00
1755 Hale & Norcross.....	7.00@7.00	400 Andes.....	6.00@6.00
2350 Justice.....	1.30@1.30	575 Alps.....	2.10@2.10
240 Justice.....	2.00	2.00@2.00	
1400 Kentuck.....	5.00@5.00	175 Bodie.....	3.00
2320 Mexican.....	1.10@1.10	915 Benton.....	2.00@2.00
370 Overman.....	1.70@1.70	505 California.....	2.25@2.25
2015 Ophir.....	2.70@2.70	505 Con Virginia.....	2.25@2.25
585 Savage.....	8.00@8.00	2385 Chromer.....	4.00@4.00
5 Seg Belcher.....	3.15@3.15	1300 Crown Point.....	5.00@5.00
2075 Sierra Nevada.....	4.95@4.95	780 DeFrees.....	1.10@1.10
230 Succor.....	3.00@3.00	1230 Dayton.....	4.00@4.00
1500 Union Con.....	13.00@13.00	940 Grand Prize.....	11@11
200 Utah.....	1.30@1.30	200 Golden Chariot.....	7.50
320 Yellow Jacket.....	9.00@9.00	200 Grand Prize W.....	1.00
AFTERNOON SESSION.		680 H & Norcross.....	1.00
785 Alpha.....	14@14	37 Andes.....	6.00
270 Alps.....	2.70@2.70	50 Hornet.....	2.50
200 Argenta.....	1.60@1.60	400 Independence.....	1.00
1190 Argenta.....	2.10@2.10	320 Jackson.....	3.00@3.00
250 Bodie.....	3.00@3.00	100 Kossuth.....	1.00
630 Bullion.....	61@61	400 Leopard.....	1.40
150 Bodie.....	3.00@3.00	250 Leeds.....	2.25@2.25
10 Bechtel.....	5.00	370 Leviathan.....	4.00@4.00
1800 Belle Isle.....	2.00@2.00	240 Lady Wash.....	1.00@1.00
600 Con Virginia.....	2.50@2.50	245 Modoc.....	8.00@8.00
125 Chollar.....	3.00	1.00@1.00	
530 Crown Point.....	5.00@5.00	70 Northern Belle.....	1.15
1800 Chromer.....	2.20	100 New Coso.....	5.00
400 Comanche.....	1.65@1.65	1300 New York.....	1.10@1.10
175 Dayton.....	4.00@4.00	1300 Ophir.....	2.80@2.80
1550 DeFrees.....	1.10@1.10	165 North Con Vir.....	3.00
150 Day.....	4.00	980 Ophir.....	2.70@2.70
770 Exchequer.....	5.00@5.00	780 Overman.....	2.40@2.40
160 Eureka Con.....	4.00@4.00	50 Panther.....	3.00
630 Gould & Curry.....	5.00@5.00	25 Prospect.....	4.00
1175 Grand Prize.....	11@11	100 Rye Patch.....	5.00
150 Gila.....	1.40@1.40	35 Raymond & Ely.....	8.00
100 Hornet.....	2.50	800 Rock Island.....	2.00
1750 Independence.....	4.00@4.00	300 Silver Prize.....	1.00
200 Jackson.....	3.00@3.00	1340 St Louis.....	2.00@2.00
50 Kossuth.....	2.00	500 Solid Silver.....	5.00@5.00
970 Lady Wash.....	7.00@7.00	500 Silver City.....	5.00
200 Leeds.....	2.25	400 Savage.....	9.00
1200 Leviathan.....	4.00@4.00	385 South Justice.....	1.00
940 Leopard.....	1.45@1.45	1070 Silver King.....	1.30
355 Manhattan.....	1.10@1.10	1070 Trojan.....	1.20@1.20
1370 Modoc.....	1.10@1.10	100 Tiptop.....	1.00
6510 New Coso.....	2.70	1000 Wells Fargo.....	6.00
235 Northern Belle.....	1.15@1.15	255 Ward.....	8.00@8.00
200 North Con Vir.....	2.50	975 Woodville.....	1.10@1.10
1750 Navajo.....	1.10@1.10	1225 Yellow Jacket.....	12@12

Friday A. M., Nov. 15.	Thursday A. M., Nov. 15.
235 Alpha.....	11@11
1795 Alpha.....	10@10
1330 Bullion.....	5.00@5.00
780 Belcher.....	5.00@5.00
355 Best & Belcher.....	17@17
610 Con Imperial.....	7.50@7.50
50 Confidence.....	1.00
275 Crown Point.....	5.00@5.00
100 Leeds.....	2.25
450 Con Virginia.....	2.25
1220 Caledonia.....	2.20@2.20
1000 Caledonia.....	2.20@2.20
500 Dayton.....	4.00@4.00
300 Dayton.....	4.00@4.00
620 Gould & Curry.....	5.00@5.00
1330 Hale & Norcross.....	7.00@7.00
350 Justice.....	9.00@9.00
300 Julia.....	2.00@2.00
355 Mexican.....	2.25@2.25
3410 Mexican.....	10@10
3415 Overman.....	1.50@1.50
4045 Ophir.....	1.90@1.90
635 Silver Hill.....	1.40@1.40
5 Seg Belcher.....	3.15@3.15
855 Savage.....	8.00@8.00
500 Succor.....	3.00@3.00
70 Utah.....	1.30@1.30
610 Yellow Jacket.....	8.00@8.00
AFTERNOON SESSION.	
310 Alps.....	2.70@2.70
150 Argenta.....	1.60@1.60
50 Challenge.....	1.00@1.00
415 Andes.....	6.00@6.00
400 Belle Isle.....	3.00@3.00
600 Bodie.....	3.00@3.00
30 Bechtel.....	5.00
195 Baltimore Con.....	1.10
1450 Boyle.....	1.50@1.50
1800 Boyle.....	5.00@5.00
630 Dayton.....	1.825@1.825
400 Chromer.....	5.00
930 California.....	2.20@2.20
500 DeFrees.....	1.10@1.10
1030 Day.....	4.00@4.00
1385 Ophir.....	2.80@2.80
50 Eureka Con.....	4.00@4.00
240 El Dorado South.....	1.10@1.10
1600 Grand Prize.....	12@12
50 Gila.....	1.10@1.10
240 Nevada.....	7.00@7.00
150 Golden Chariot.....	7.50
100 Hussey.....	3.00
900 Hornet.....	2.5



# MINING SUMMARY.

The following is mostly condensed from journals published at the Interior, in proximity to the mines mentioned.

## California.

### AMADOR.

**CONSOLIDATION OF MINING PROPERTY.**—Amador *Leijer*, Nevada, The Loyal lead and Pennsylvania mining companies have consolidated. The claims join each other on the north of the Gover ground. This consolidation is expected to lead to important results. The owners have already taken steps looking to the erection of a new mill. The crushings of Pennsylvania rock made recently realized handsomely, justifying the immediate construction of a mill. The contract for the work has been let and operations were started this week. The machinery of the old Loyal lead mill will be utilized in the new one as far as possible. The contractor says he will have the mill in running order inside of 50 days. The shaft of the Pennsylvania, now an incline, is to be straightened, and from this the ore for supplying the mill is to be raised. Lively times are in store for New Chicago when the Gover and Pennsylvania mines are employing their full complement of hands and both mills are in active working.

**THE ONIDA MINE.**—This mill is running its full complement of 60 stamps this month, to dispose of the piles of rock which have accumulated at the dumps during the period of water scarcity.

**THE WORKMEN ENGAGED IN MAKING A NEW FLUME TO SUPPLY THE GOVER WITH WATER EXPECTED TO GET THROUGH WITH THE JOB LAST TUESDAY.** By this time the Gover mill, we presume, is operating on the quartz, infusing new life into New Chicago and vicinity.

**VOLCANO.**—On Monday last the Volcano gold and gravel mining company resumed operations, the recent rains having increased the water supply sufficient to run their drifting machinery 12 hours. Their tunnel is in 700 feet and they have 1,400 feet farther to run in order to tap the basin, but with a drill that strikes 500 blows per minute and bores a 20-inch hole in the hardest kind of rock in 25 minutes, it will be seen that it is only a question of time, and short time at that.

**ON THE DOWNS MINE** they are getting down to water level and the fode is somewhat broken up, but the rock is good, and Bill Downs, the Superintendent, thinks they are all right for a good mine.

**THE GRIZZARD MINE** has tapped his lode with the drain that he has been running, and has now a body of ore two feet in width, 120 feet in length and 15 feet in depth, that is considered good for \$50 per ton.

**MR. BARBER, from the Danc mine,** has brought in some fine specimens and is confident that he has a good thing.

### CALAVERAS.

**BIO CLEAN-UP AT SAN BRUNO.**—Calaveras *Chronicle*, Nov. 10: A large quantity of rock—about 300 tons—from the San Bruno, at Mosquito, has lately been crushed in Garland's mill at that place. The rock averaged \$20 per ton—a splendid yield, considering that all the vein matter was put under the stamps. Sinking the main shaft has been commenced, the most favorable indications being observed in the work progress. The San Bruno is being very energetically worked under the superintendency of J. L. Hoye.

**BLUE JAY—RICH ROCK.**—The richest quartz in the world continues to be taken from the Blue Jay, at Mosquito. There is nothing to equal it this side of that place whose streets are popularly supposed to be paved with the precious metal. Dumas, *per se*, when he gave wings to his imagination through the column of Monte Cristo, never dreamed of such wealth as there is in the Blue Jay. Instead of the rock containing gold, like ordinary quartz, the ledge is a vein of gold contaminated with a little ore. We hear that a third interest in the mine was lately sold at a high figure.

### FRESNO.

**FRESNO GOLD MINE.**—Fresno *Expositor*, Nov. 10: The quartz mill designed for the Fresno gold mining company was shipped from San Francisco last Friday. It will have capacity for 10 stamps, but only five will be put in at present. The mill building is already completed, and it is expected that the machinery will be put in and the mill ready for work by the first of December. The mill will be run by water power. The main shaft is now down over 100 feet, at which depth a drift is being run on the ledge. The drift is now in about 30 feet. At the bottom of the shaft the ledge is about two feet wide and is gradually widening out, and the walls of the ledge are well defined. About 50 tons of choice milling ore are already in the dump, and it is expected that it will yield over \$150 per ton. Charles E. Striven, is Superintendent of the mine.

**PETROLEUM.**—Fresno *Republican*. From Deputy Sheriff Witthouse, who has just returned from the Coast Range, we learn that J. D. Jones, of Visalia, has dug a well 18 feet deep near the Poso Chino, in the bottom of which there is now eight inches of oil. The oil burns freely, and the owner is sanguine of finding a large deposit of it. He is now preparing to bore down to 300 feet and make a thorough test of the matter. In the vicinity of the oil discovery some Mexicans are opening a coal mine, the vein being four feet wide with other smaller veins dipping toward the main one. They are running a tunnel, and with a good prospect of developing a large body of bituminous coal.

### INYO.

**BULLION SHIPMENTS.**—Coso *Mining News*, Nov. 10: The Emigrant mining company shipped, last Wednesday, two bars of bullion; weight, 178 pounds, valued at \$3,000. Some 30 pounds of amalgam yet remains in the pans, and claims from 10 to 15 tons of five stamps.

**LUCKY JIM.**—We are informed by those who visited the mine, as also by miners working therein, that the Lucky Jim, under the skillful foremanship of Jas. Hickey, is looking splendidly, and, in fact, never looked so well, large bodies of good ore having been developed within the last few weeks.

**EXCELLENT PROSPECTS.**—Scarcely a week passes that we do not hear of some new find in this mining section. Yesterday we went to see one of the best, so far as development, of any yet brought to our notice. It is the El Monte mine, situated in the same mineral belt as that of the Defiance, Cuervo, Hidalgo, Promontorio and other important mines in this district, and situated some two miles easterly from Darwin. The mine is owned by John McEnroy, who discovered some three years since, but the work development only commenced some two months ago. An incline shaft has been sunk upon the ledge to a depth of 70 feet, following the foot-wall, and in fine ore from the surface to the bottom. We found upon the dump about 100 tons of splendid ore, all taken from this shaft, which gives some idea of the strength of the ore, no drifting having been done. The ore is good grade, assaying to run \$40 to \$50 in silver and carrying from 30% to 60% lead. A road is now being built, down an easy grade, to connect with the road in the Darwin Flat, which will facilitate the delivery of ore to the furnaces at very little expense. We do not think we exaggerate in the least when we say that the El Monte is one of the best prospects yet struck in Darwin.

**CERRO SAN JUAN.**—Cerro *San Juan*, Nov. 3: The Cerro Gordon Co., silver mining company has sold to the Cuervo mining company the Cuervo mine and such portions of the St. Louis, Capital and Grand mines as are covered by the present location of the Cuervo, situated in Darwin. The Cuervo company execute a note for 60 days for \$50,000, secured by mortgage on all their property, including future production.

**PANAMINT.**—Capt. J. G. Messie, of Panamint, paid our sanctum a visit on Monday last. The works of the Surprise Valley M. & M. Co. have been entirely closed down for the winter, two men being left in charge. None of the expected ore bodies have been so far developed in the sinking which has been going on so long in the Homelock and Wyoming mines, though the ledges are still very

powerful ones. It is certainly to be hoped that the company will resume sinking next season.

### MONO.

**THE MILLS.**—Cor. *Inyo Independent*, Nov. 3: Notwithstanding the inclemency of the weather, the mills keep dropping their regular quota of stamps. The Indian Queen mill has just completed the most successful and profitable mill of 30 days within our knowledge, and is producing a four-stamp mill, having crushed 120 tons of ore, assaying in value \$138.17 per ton, thereby producing \$22,570.50 worth of silver. Their average chlorination being 93%, and the assay amalgamation 94%, thereby producing \$1,041.64 more than the 80 guaranteed. The mill is now owing to the roasting furnace, being White's patent, with Howell's improvement, which we believe to be unparalleled in the history of roasting furnaces, together with the proficiency of the Superintendent, Mr. Howell. However, the above mentioned run was made under the direct superintendency of Mr. Mr. Adams. The Indian Queen mine, like the Diana, is being worked on what we call the tribute system. The Superintendent thinks this the most profitable. The Diana mill is producing a reasonable amount of bullion, having shipped this month \$1,500, and unsurpassed in the sage brush country for fineness, assaying about 107 fine. The Diana mine is looking up. A rich and extensive body of ore was struck recently in the 350-ft level. The stock is not on the market now. Mr. John Robinson is just in from the market. He states that owing to this Alaska snap, Lake district is almost depopulated, but feels confident the mines there will bloom and produce next summer. Parties here talk of building a road from Benton to the Lake district mines next spring.

### NEVADA.

**BLUE TENT.**—Nevada *Transcript*, Nov. 9: The Blue Tent gravel mining company's claims at Blue Tent are the richest and most extensive of any in this section of our country. The owners have spent an enormous sum of money to get the diggings opened in a first-class manner, and have succeeded admirably in so doing. On Wednesday last they set off a blast of 700 kegs of powder, and it was a success in every respect. It broke up the ground for a long distance, and, in fact, much more work was accomplished than was expected. This is the second blast that has been set off since the water gave out, and still an other of 800 kegs of powder is in course of construction, and will be set off as soon as completed. The improvements that are now being carried on are of the most extensive and most character, being greatly to the value of the property. They have had their ditches thoroughly overhauled from one end to the other, and we venture to say they are in as good condition as any in the State. Under the able management of D. T. Hughes the property is bound to pay handsomely in the future.

**RICH STRIKE.**—A number of years ago a man named Kingsbury took up a quartz ledge on Little Deer creek, about three-quarters of a mile from town, at the mouth of Pleasant ravine. He took out considerable rock after running a tunnel in about 100 feet, but it did not pay as well as he expected. He abandoned the claim and left this part of the country. About two years ago Mr. A. Coe and son re-located the claim and extended the tunnel 400 feet, and have taken out a large amount of rock which yielded from \$1 to \$12 per ton. This kind of rock did not give them much profit, but they pegged away with the firm belief that there was a rich chute of rock there, and they were determined to find it. A few days ago, to their great delight, they found the expected new chute of rock, which contained free gold and very rich sulphurates, and it is said to be as pretty and as rich rock as was ever found in that vicinity. They have taken out about 20 tons of this kind of rock, and it is now being hauled to the Murchie mill to be crushed. About a year ago the mine was bonded for \$50,000, and a short time before this pay chute was discovered the bond expired. To-day the mine cannot be purchased for \$20,000, as it shows up now to be worth more than that sum. We are glad that Mr. Coe and son have met with such good luck, for they are hard workers and deserving men.

**GRACE.**—J. Jacobs has returned from San Francisco, and will now commence active work on the Jacobs claims, at Quaker hill. We understand new hoisting works have been purchased, which will arrive in a few days. It is known that a blue gravel lead runs through the ground, and a shaft will be sunk without delay for the purpose of finding it.

### PLACER.

**SHADY RUN MINES.**—Dutch Flat *Forum*, Nov. 8: The Wild Yankee mine, superintended by Charles Wedgewood, is fitted up and ready to commence another season's hydraulic. This company, since the closing down of last season's washing, have done a large amount of work in prospecting their drift diggings, a great deal of which, though not about as rich as the first, is nevertheless pay well to work at the present rate of prices. The ground to be worked this winter pays large for hydraulic.

**THE NORTH AMERICAN MINE,** worked under the supervision of H. K. Develing, has not during the past few months worked but four men, owing to scarcity of water. This is entirely a drifting mine, and from the systematic manner in which it is being worked, and the promptness with which the claims are being worked, it is yielding splendidly. The late rains having increased the supply of water, a larger force of men will be put to work immediately.

**NEW LOCATIONS.**—The Bilk and the Charter Oak, are the names of two mining claims pre-empted recently. They contain 80 acres each, embracing the southeast quarter of section 25, and are therefore located on the Little Bear river about one mile above the mouth of the Little Bear river sawmill. At this point the river is running in bedrock, but within a short distance of the south bank a gravel wash is discernible. Both tunnels are started from the Little Bear river, and are being run in a southerly direction. The tunnel in the Bilk is advanced 100 feet in bedrock, but as yet there are no signs of gravel. The tunnel in the Charter Oak is advanced 100 feet, and is yielding splendidly. The late rains having increased the supply of water, a larger force of men will be put to work immediately.

**QUARTZ MINING AT AUBURN.**—Grass Valley *Union*, Nov. 12: On a recent visit to Auburn we learned something of the progress of quartz mining in that neighborhood. There are several mills running, mostly on custom rock, at Ophir, and considerable prospecting is being done on the divide of the Chain and the Crest of a new ledge is very satisfactory. A new quartz mill is being erected on North ravine, 15 miles west of Auburn, in the center of the district, which will be furnished with water power from the Auburn canal. Duncan hill, one mile west of Auburn, is the scene of busy operations, and the developments made upon the Centennial mine, on that hill, are of a most encouraging character. The location of one of the ledges being in the series of east and west veins which traverse the district, and have been noted from the early days of California mining for prospecting well in the croppings. No systematic work was ever done upon the Centennial mine until about a year ago, since which time work has been steadily prosecuted. The main ledge is now down 120 feet, and the lower shaft is down 105 feet. At the bottom of the incline the ledge is from 15 to 25 feet in thickness, and shows well in free gold and sulphurates. The ledge is in a metaphoric slate, which is highly mineralized, and makes firm walls. A level has been run at the depth of 105 feet, connecting the two shafts, and at the bottom of the main incline (170 feet) another level has been started. The location of the mine

is very favorable for working, there being scarcely any water to handle, and so far but little blasting ground encountered. The quality of the rock is very similar to that taken from the best mines of the Grass Valley district, mills easily, and pays handsomely, as we were assured that the rock taken out and crushed had averaged \$10 per ton, and the rock being taken out at the time of our visit, from the depth of the lowest workings, was estimated to go \$100 per ton. All appearances go to indicate that the Centennial is a really valuable mine, and when the drifts have been sufficiently extended and stopes opened, to demonstrate that the mine is one of the best of size and quality, it will take rank among the good mines of California, and its success will go far toward the development of the resources of the Auburn quartz mining district, which should be among the very best districts in the State, although it has been greatly neglected by mining men and energetic prospectors.

### PLUMAS.

**WORK SUSPENDED.**—Plumas *National*, Nov. 10: We are sorry to have to note the cessation of operations on the Franklin mine for the present. The machinery which has been used by the company proved totally inadequate, and one day's work was done, and the mine was suspended. The shaft is 204 feet down, and it is said to have to go from 20 to 40 feet farther to strike bedrock. What the managers of the company propose to do we do not know, but it seems as though, after an expenditure of nearly \$22,000, they would certainly risk enough more to find out what is in the channel. It seems almost a certainty that the channel is a rich one. The Franklin shaft goes up deep into the mountain, and the Gravel company are on a higher bar, and that, too, on the "long side" of a bend in the old river bed. Now the experience of river miners is that the "short side" of a bend is invariably the place to look for the rich deposits, and if the "long side" shows such paying gravel as is to be found in the Blue Gravel claim, the channel itself must be rich. We cannot state the exact value of the mine, and believe that if the company put on machinery of sufficient capacity to pump the water and complete the shaft, they will be rewarded by opening a claim worth a hundred times the amount of their investment.

**GRANITE BASIN.**—Batchelder & Brown are running their little quartz mill in this new mining district with good success. The ledge is about three feet in width, and pays well and rapidly. The mine is now running at figures per ton, but in the short time the mill has been running they have sold some \$3,000 worth of dust. They have found a streak of decomposed quartz in the granite below the mill, which they are now working, and which promises to be rich. "Bach" has the reputation of being the best quartz prospector in the county, and it seems that his recent discovery in Granite basin proves it. Serrin & See are opening another ledge near by, and have good chances for a paying mine. The chances for a good district at Granite basin are very flattering.

### SIERRA.

**MONTE CRISTO.**—Mountain *Messenger*, Nov. 10: This company has instructed Mr. Day to make every arrangement for working this winter. No effort will be spared to complete the tunnel, and get ready for a new mill by spring. The Secretary of this company, T. G. Humphrey, Esq., from Stockton, has been at this mine within the last few days, and has gone below again perfectly satisfied with everything done in connection with the mine. This ledge prospects well and is in every way likely to be a success.

**RELOCATED.**—The old Sierra Nevada Lake, water and mining company's ditch has been relocated recently. Where the locators intend to get water to run in it we are not advised. Perhaps they may find water for a portion of the year.

**FOURTH CITY.**—Our rain has started the water but very little. The Bald Mountain mine was able to wash the most of last night. The North Fork mine at last, the little accident occurred in the North Fork mine last night, by which Supt. McDougal and a man by the name of McDonald were slightly injured. They put off a blast of giant powder in a body of pipe day, to make a connection, and supposing it had blown through, commenced to dig a hole, and when they got to the bottom, instead of finding it had found vent in a seam and when suddenly weakened the concentrated gas from the powder, blew the dirt into their faces in such a manner that at first it appeared to be a second explosion. Both eyes of McDonald and one of McDougal's were well filled.

### VENTURA.

**GOLD.**—Los Angeles *Express*, Nov. 10: Mr. Eggleston exhibited in our sanctum this afternoon 50 ounces of gold amalgam cleaned up from two weeks' run of the 10-stamp mill at the Frazier mine. The amalgam commands \$17 an ounce in its crude state, and makes an average of about \$10 a ton for the ore reduced. This mine is located in the Piru district, Ventura county, and is owned by Maxwell & Co.

## Nevada.

### WASHOE DISTRICT.

**CALIFORNIA.**—Gold Hill *News*, Nov. 14: Daily yield 650 tons of ore. The ore stops on the 1650-ft level continue their usual yield of rich ore. The lateral drift in the ore vein on this level, running to connect crosscuts Nos. 3 and 4 is now in a distance of 23 feet, the face still in rich ore. East crosscut No. 4 is in 90 feet, the face still in low grade ore. The connections between the upraise from crosscut No. 1 and the main shaft will be completed, and a good circulation of air obtained on that level a day or two more. On the 1600-ft level the vein is widening to the westward, the character of ore showing better as the stopes advance. The ore stops on the 1550 ft level continue their yield of rich ore.

**CON. VIRGINIA.**—Daily yield 550 tons of ore, keeping the mills churning at full capacities. The ore stops on the 1650-ft level are showing splendidly, and the usual quality of good ore. The conjunction of the east and west ore bodies on this level going south gives a continuous body of pay ore, from wall to wall of the ledge, of a very rich quality. No work is yet being done at the 1550-ft station in the C. & C. shaft.

**CALIFORNIA.**—The north drift on the 1600-ft level is being rapidly advanced toward the north line, the face in fine healthy vein matter.

**JULIA COX.**—The face of crosscut No. 1 on the 1500-ft level has passed through a fine character of ledge matter for over 100 feet and has now reached the west clay wall. East crosscut No. 6 on the same level is steadily advancing, the face in soft porphyry streaked with seams of clay and quartz, and a strong seepage of water coming in from the ledge. The chance of finding the east vein in this drift are growing more favorable.

**YELLOW JACKET.**—On the 2200-ft level the main drift east toward the new shaft is in 504 feet, and the last five feet of it as well as the face is in a solid body of quartz, assaying from \$5 to \$11 to the ton. Some water is coming from it. The new shaft is down 970 feet, and sinking in the soft ground.

**OPHIR.**—Great interest has been created during the week in this mine by the finding of a fine vein of good ore, 10 feet in width, in the east drift on the 1900-ft level. This ore was struck at a point 390 feet east of the shaft, and is evidently but the tail end of a good-sized body of ore lying somewhere in the immediate neighborhood. The drift, at the mouth of the vein, which is about 200 feet long, passed through and into what is undoubtedly a horse of porphyry, beyond which it is more than probable that the ore will be again found. There are no other changes of importance in any other portion of the mine. Work is progressing as usual at all points.

**SILVER HILL.**—The north drift on the 650-ft level is steadily advancing at the rate of 45 feet per week, toward the south line of the Justice. The east drift on the 800-ft level has advanced 28 feet during the past week, the face being in very favorable ground. M. C. Hillier, well-known as a mining man of much experience, has been appointed Superintendent and commences the management of the mine to-day.

**SIERRA NEVADA.**—The connecting winze between the

1500 and 1700-ft levels has been enlarged and put in the best condition possible, preparatory to starting an incline to prospect the ledge at greater depths. Preparations are being made to do some active sinking on the ledge and lively prospecting to the south and eastward on the 1700-ft level, very short time.

**UTAH.**—The north drift at the 1350-ft level is fairly started and is being pushed vigorously toward the ore vein. The south drift on the 1150-ft level, running to connect with the north drift from the Sierra Nevada, is making good progress and will complete the proposed connection some time during the coming week. This will thoroughly ventilate and cool the mine to that depth.

**OVERMAN.**—The east and south drifts on the 1400-ft level are being steadily advanced, the face of the east drift being in porphyry, carrying occasional streaks of quartz. The south drift is following the course of the vein, which shows a greater concentration of the ledge as the work progresses toward the south.

**RELIOS.**—The air connections between the upraise and the main incline on the 1500-ft level have been completed, and a drift started south in the ore vein to more thoroughly prospect that portion of the mine. The north drift on the 2000-ft level of the Imperial is steadily advancing, the face in quartz mixed with porphyry.

**JUSTICE.**—Daily yield 300 tons of ore. The upraise from the 1000-ft level has completed a connection with the 500-ft level, giving a much better circulation of air.

**NORTH COX, VIRGINIA.**—The mine was closed up last night before last, everything working the very best day. The new strike in the Ophir has infused new life into the managers and stockholders of this mine, as their claim lies in a direct north and south line with the new discovery.

**GOLD & CARRY.**—The machinery is working well and good progress is being made with the prospecting at every point.

**CROWN POINT.**—About 50 tons of good milling ore per day is being taken out of the 1600-ft and 2300-ft levels. The ore stops on the 1600-ft level still show fine ore, and the face of the south drift on the 200 level still continues in a fine character of ore.

**BROWN.**—Sinking the south winze below the 1600-ft level is making excellent progress. It is now down 123 feet. The main drain shaft is down 160 feet below the 2000-ft station.

**CHOLAR-POHOS.**—Driving the east drift on the 1500-ft level was resumed during the first part of the week. It is now advancing at the rate of four feet per day. About 50 tons of ore per day are being extracted from the old upper workings. The assay value of the ore is \$20 per ton.

**DALE & NORCROSS.**—In the main incline the lava has now been passed and the head of water appears to be completely overcome, so that there appears to be no impediment whatever to soon reach and drain the 2000-ft level.

**SOUTH COMSTOCK.**—The north cross-drift on the 500-ft level is now in 95 feet from the main shaft, the face showing quartz which gives low assays, improving as the drift advances.

**BEST & BELCHER.**—Sinking the winze below the 1700-ft level is making good progress. West crosscut No. 1, on the 1700-ft level, is in 120 feet, the drift having passed through several streaks of quartz during the week.

**SUCCESS.**—Sinking the shaft goes steadily forward, and the material at the bottom of it is the most encouraging description. It is bird's-eye porphyry, with good looking seams of quartz.

**ALTA.**—The bottom of the shaft is in soft vein matter of a favorable character. The bottom of the winze being sunk below the 1050-ft level is in ore.

**CON. IMPERIAL.**—The station in the joint Alpha-Imperial crosscut is finished, and sinking the joint winze commenced.

**DALE & NORCROSS.**—Ore extraction from the 350-ft level goes forward lively, keeping the Vivian mill steadily running. The bullion yield of the ore is not, of course, ascertained as yet, but it is bound to pay.

**NORTH DAYTON.**—The lower tunnel has been cleaned out and put in good repair, and now the exploration of the ledge is being commenced. The pumps are running splendidly, lowering the water daily. It is now down 143 feet below the 1900-ft level.

**LADY WASHINGTON.**—The machinery has been thoroughly overhauled and put in complete order, work was resumed in the mine this morning.

**MEXICAN.**—Sinking the joint winze on the Ophir line is making the best of progress, so also are the prospecting drills on the 1405-ft level.

**LADY BRYAN.**—Not ready for resuming work.

**SITRO TUNNEL.**—Very good progress continues to be made in advancing the beader, the face being in favorable working material.

### CORNUCOPIA DISTRICT.

**MINING PROSPECTS.**—Cor. *Silver State*, Nov. 12: Tuscarora, lately, has overshadowed us, and it is hard for a Cornucopiate to continually tell of the buildings here that have been torn down and taken over there this last summer and fall; but that business is closed now, and we cannot help thinking that those who are left here are better off, and that many who have left will, within one year from this, wish they were back here again. The mining outlook for this camp never was brighter. True, Cornucopia stocks are "way down in the market, but we feel that that is no criterion to go by. The developments in the Leopold are most favorable. The other day, in the south-easterly drift from the 900-ft level they struck water, and there is every indication of soon hitting a fine body of ore in that mine. Mr. Coffin, the Superintendent, is now in San Francisco making arrangements for the funds to settle up all back delinquencies of the company. The Hussey cannot, from its present showing, be too highly spoken of. Every day's work in this mine demonstrates the fact that it is a mine of the first-class. They are now working their ore at the Leopold mill. During the last few days they have had about 90 tons worked there, which turns out well; but the workings at the mine show that they have a body of ore in sight which will work up into the hundreds—sufficient to supply a 20-stamp mill for a year's run at least. The Panther hoisting works started up a few days since, and make quite an addition to our camp. Superintendent Willard says that the company will have a mill of 20 stamps next season, and be shipping large quantities of bullion.

### ELY DISTRICT.

**RAYMOND & ELY.**—Poche *Record*, Nov. 10: The work is going on in this mine with satisfactory result. The winze being sunk from the 1200-ft level is down about 50 feet, and as yet have encountered no water to interfere with the progress being made in sinking; are shipping the usual quantity of ore from the mine, which is working well. The mill is running along as usual, producing bullion at a fair rate, \$14,000 having come up on Wednesday, and there will be \$8,000 more come up to-day. The tailings are now being worked with much more satisfaction than ever before.

**DAY MINE.**—The work of development and opening the mine is being pushed with vigor and with satisfactory results. Work is kept up on the two tunnels night and day. Whilst excavating a place on what to build the blacksmith shop, near the mouth of tunnel No. 1, a large body of fine ore was developed, which has been opened about six feet, showing well that distance.

**ALPS CONFRATY.**—The usual amount of chloride ore is being taken from the Yerington stoep on the ninth level. The development on the 11th level is still improving; a drift has been run 65 feet on the vein and stoping commenced during the week. It is expected when both stopes are open, sufficient ore will be mined to run the mill up to full capacity. Sixteen hundred feet steel wire cable has been ordered and will arrive about the 20th inst., when it is the intention of the company to sink the shaft 100 feet deeper, making total depth 1,340 feet, and then drift west. \$27,000 in bullion was shipped by the company during the month just past.

### EUREKA DISTRICT.

**EUREKA COX.**—Sentinel, Nov. 10: The magnificent ore body of this company, first found on the ninth level,



### Meteorological Analogies.

EDITORS PRESS:—Is not your querist, in issue of October 20th, who suggests that the rainfall in Australia may be the gauge of our rainfall, a good deal out in his reckoning? It is well known that the rain-bearing currents originating in the tropics have a westward velocity of something near 1,000 miles per hour, and, as they go north, this motion bends them to the westward, giving us a southeast wind. In the nature of things, we cannot, therefore, receive more than partial showers from the Pacific, while currents originating in the Caribbean sea would take us in their course. Now is it not more probable that the rainfall in old Mexico is the true gauge for our coast? Of this much, at least, I am certain, that floods in Mexico are almost invariably followed by floods in California, and I feel confident that a study of this subject, by some one possessing the necessary facilities and time, will aid us materially in predicting our seasons.—A READER, Davisville, Cal.

We have little faith that any constant correspondence or sequence can be found between special localities in the northern and southern hemispheres, as our querist upon this subject, a few weeks ago, believed. There is a general relation between the aggregate rainfalls north and south of the equator, and the northern hemisphere has about one-third the greater downfall. Keith Johnston, who was one of the earliest of the modern school of investigators on this point, computed the average annual rainfall in the southern hemisphere at 26 inches, and in the northern at 37 inches. Later writers think averages drawn from fuller data will reduce this estimate somewhat, but will still show considerable difference. While this fact is upheld by Reclus, Flammarion, and Arnold Guyot, and all of them have written carefully of the causes affecting the distribution of water upon the surface of the earth, we find in none of their writings, which we have read, any hint of a relation between special regions north and south of the equator in the sequence of wet or dry seasons.

That there are relations between the two hemispheres, taken as a whole, is thus expressed by Elisee Reclus, in his large work on "The Ocean": "By a remarkable contrast, the northern hemisphere, which receives the greatest quantity of water, supplies the least proportion of it. In fact, the ocean restricted in the north by continents, spreads on the south of the equator, so as to cover almost the entire circumference of the earth. It thus presents to the solar rays an immense surface of evaporation, incessantly feeding the clouds of the atmosphere. In this way that half of the globe which furnishes the most vapor is that which receives the least rain in exchange; a circuit of the aerial currents is, therefore, necessarily established between the two hemispheres, and thus equilibrium is maintained. It is in great part the vapors from the southern Atlantic, that supply the rivers of Europe."

Although such general interchanges between the hemispheres are noted, the question assumes different form when application is made to special regions. To California, especially, with its climate, which may be termed accidental and not that generally prevailing in our latitude, it may be difficult to apply lessons drawn from conditions elsewhere. Of our exceptional location, Arnold Guyot says: "General laws governing the rainfall are often considerably modified by the structure of the continents, the local features and the climatic situation of the different countries in each belt. California, for instance, and the Southern States east of the Rocky mountains, are on the belt of winter rains, and still the regime of their rains is entirely opposite."

Regarding the points made by our correspondent, whose letter is printed above, we can only observe that he is altogether wrong in his premises, and therefore wide of the mark in his conclusions. The earth moves from west to east, thus giving the sun an apparent westward course. The currents of air from the north pole, as they traverse southward, find themselves continually lagging behind as they approach points on each lower parallel which have a greater eastward motion. This current moving south and west gives rise to what we designate as northeast winds. Now if we reverse this, as is the case with the currents moving from the tropics toward the north pole, we find that the currents start with a high impulse towards the east, or an eastward speed 1,000 miles per hour greater than the eastward movement at the north pole. As they pass northward they find themselves continually more and more in advance of points on parallels they traverse, and the result is a movement towards the north and east, and this gives rise to what we term southwest winds. It is upon these winds we rely to bring us the humid vapors rising from the tropical regions of the Pacific ocean.

With this corrected starting point in his reasoning, our correspondent will find that the great quantities of vapor gained from the Gulf of Mexico and the Caribbean sea are carried by southwest winds towards the western coast of Europe, where they are, in fact, deposited. There is no movement of humid tropical currents from the Caribbean sea toward this coast. If there were the now arid regions of New Mexico and Arizona would be plentifully watered, and our coast would probably be as dry as is the coast of Peru. If, then, it be true that seasons of floods in Mexico correspond with seasons of floods in California the coincidence may be accidental, during a short period of observation, or, if constant, the causes must evidently be other than our correspondent imagines.—Pacific Rural Press.

### Rural Homes.

Our illustrations on this page show two pretty rural homes, and they may be suggestive to California home-makers. They are just such light and graceful structures as our gentle climate demands. Not upon us is laid the costly weight of fortress-like habitations, impenetrable to hoisterous blasts or silent power of frozen mercury. Home comfort and cosiness are not bought in California at the price of "listed" doors and doubled windows, nor need enclosing walls be measured by the cubic foot. No! give us hut tight "weather hoarding" and a touch of snow-white plastering within, and a pretty open fire will have full power to repel the fiercest

in the line of home making is the comment of all travelers in all directions. And this is but the beginning of the end. The coming year, if its realization be but a part of the promise, which the easily falling rains declare, will give rural building throughout our State a brisk impulse forward. Thus it ought indeed to be. The outcome of the season just passed has been much better generally than was anticipated. The proper place for the investment of farming surpluses is in the improvement of means for production and in the improvement of rural homes. Thus invested, surplus earnings are safe and gloriously productive, both in marketable commodities and in family comfort and content. Never in the history of our State have building materials been so cheap and abundant as now. Never has constructive



[DESIGN FOR COUNTRY VILLA AND CARRIAGE HOUSE.]

winter chill which most of our counties ever know.

This is indeed a great advantage on the side of the California home-maker. Thus it is that a pretty cottage answers most of our farmers' needs, and if it be tasteful in design, neat in furnishing and beautiful in surrounding growth of tree and shrub and flowering plant, it is a home than which princes have no better. Nature aids us not alone in temperature and sunlight, but hides these potent agencies serve us farther. It calls up around our homes a growth of luxuriant foliage and crowns of fragrant bloom. It gives us hedges and arbors of plants which in severer climes cannot escape the compass of the jardiniere. It covers our roofs with vines which there creep but sluggishly around the fire-warmed window frames. It surrounds

skill been so plenty and so desirous for employment at reasonable wages. The plain deduction is, build and beautify.

The cottages, which our illustrations show, are simple and inexpensive. As such they can hardly fail to come within the means and answer the needs of the humblest of our readers; and yet are they not very tasteful and suggestive of simple beauty and comfort. One is just such a habitation as one of our young men could plan to encase his little family, and the other is commodious enough to serve as a casket for quite a string of home jewels. They are put forth on our part as little more than suggestive of what can be done in designing homes of moderate expense, and we doubt not readers can remodel them and devise interiors according to their tastes and ideas of convenience. We he-



RURAL COTTAGE AND BARN.

our habitations with vineyards and orchards of fruits which there must have glass above and fire beneath. And yet, with all these generous gifts, by far too few are pretty rural homes. In some instances, the newness of the settlement and the harsher duties of payments for the land itself have, thus far, crippled handsome home building and adornment. In others, there is a lack of taste and deplorable disregard of everything which does not yield according to the standard of the dollar, but this condition of affairs is rapidly passing away. In still other instances there is an unexplained neglect, as though the cultivators of the soil had forgotten how easy it is to give the house a tasteful outline.

We have no doubt that the closing year will add hundreds to our lists of pretty rural homes. We hear of them from all the wide circle of our readers. The improved aspect of the country

lieve every family should have a voice in the planning of its own home. Build your homes. The RURAL PRESS will be a delighted guest at the "house-warming."

METEOROLOGICAL SUMMARY FOR OCTOBER.—The report of the U. S. Signal Service officer, of San Francisco, for the month of October is summarized as follows: The mean height of barometer for the month was 30.01; mean temperature, 58.2°; mean humidity, 71°; prevailing winds, west; highest barometer, 30.174; lowest, 29°; highest temperature, 81°; lowest, 1.871; monthly range, 32°; greatest velocity of wind, 38 miles per hour; total number of miles traveled by wind, 6,896; total rainfall, .65 of an inch. Rainfall in October during former years: 1871, .07 of an inch; 1872, .11 of an inch; 1873, .83 of an inch; 1874, 2.69 inches; 1875, .24 of an inch; 1876, 3.36 inches.

### The Irreverent Spirit.

The irreverent spirit is a demon of destruction. We take it for granted that irreverence toward the Almighty is the highest crime to which the irreverent spirit can attain, but it is our present purpose not to demonstrate this leading proposition, but to bring to mind a few of its corollaries as they are suggested by the events of the day.

At the present time both the city and the country are forced to think seriously of adopting unusual measures for the defense of life and property. In the city, under the glare of the street lamps and in halls for public concourse, words of ruin are spoken and threats and menaces are made against the lives and property of citizens. Long suffering and hopeful authorities have determined that free speech has overstepped its rights and privileges, and the law has placed its hand upon mouths which gave loudest voice to incendiary threats. In the country, threats of the torch have been freely made, and there are farmers in our State who have divided the night into watches and mounted guard to save their property and lives from the match of the barn burner, creeping through the darkness. Both in town and country there are those who freely threaten destruction and those who believe the danger is great enough to call for measures to avert it. Such is the present situation. It is a condition of affairs which is ruinous to the prosperity and comfort of our citizens, fatal to the progress of our State, an insult to our civilization. Society cannot tolerate it. The law proclaims against it. If it should be permitted to gain the ascendancy, we should be plunged at once into a recurrence of those dark days, which history describes and which cause the reader to shudder and grow sick at heart. The mind recoils from the thought that such events can occur in our day of light and law, and we have no idea that the law-abiding and enforcing classes of our population will permit the evil to proceed to even temporary victory. But let no one forget the possibility of evil in the fancied security of belief that it is powerless. No one can tell to what end of madness the ill propensities of reckless men may be driven by the wretched devices of the demagogue. It is the duty of every true citizen to do everything within his power to strengthen public sentiment in favor of the right and the rule of the law. No doubt the constituted authorities will guard against overt acts, but let all warn the unwary, counsel the weak and wavering, explode the fallacies of the heartless and reckless "agitator"; in short, see to it that the good sense and true strength of the people are not stolen from it by those who aim to live upon the fragments of the destruction which they may lead others to execute.

Such being our general exhortation, it is timely to make prominent the one cause to which the present danger owes its origin, and urge its repression. It is the irreverent spirit. If it be not repressed, by wholesome restraint and by inculcated perception of its ruinous tendency, it generally overflows in manhood into a stubborn and reckless defiance of laws, human and divine; a bold disregard of rights of property and a total appreciation of the value of human life. Destroying all respect for others, it, naturally enough, destroys all self-respect. It leads men, on the one hand, to perpetrate the most satanic crimes, and, on the other, to stoop to the most debasing ambitions and alliances. It misguides the intellect; it banishes all true impulses; it blunts all perceptions of right; makes the world the worse for every life over which it gains control.

As it is in youth that this irreverent spirit generally begins its ever widening course, in youth it is easiest repressed. All streams are easiest turned near their sources. The wide prevalence of this spirit should, then, read a sharp lesson to all those who are now charged with the training of the youthful mind. Here lies the key to the future. The reckless men who now raise seditions cries in our city streets, or lurk in sullen silence in country shades, are beyond the reach of any power but that of the law. Their hopeless condition is a most potent warning. They came not suddenly into their evil state. Perhaps their first lesson was in unpunished disobedience to parental authority. The steps from disobedience in youth to lawlessness in manhood are rapid as the flight of the years. If the tender mind is uncultured in the reverent thought the sure result is an intellect deficient and wayward, false in its conceptions and reckless in its actions. The youth who is not taught by sound precept and right example, will, in the majority of instances, never have a true perception of right or justice.

Experience is a good teacher, and those whom either thoughtlessness or engrossments in the world's affairs lead to forgetfulness of precept, can hardly shut their eyes to events which are now passing. Let the uprising of the turbulent and law-defying spirit to-day enforce the resolution that no one shall go out from our households to swell the ranks of future organizers of evil. We have already developed on this coast a style of youthful depravity so peculiar and so demonic that we have been forced to give it a special name. The poor city outcasts are all the seeds of future "hoodlumism" which this generation can afford to sow. Let those who rule and guide the youth in country homes be true to the charge placed upon them. It is in such homes that the true reverent spirit may best be instilled into youthful minds.



## The Greenville Quartz Mines.

During a run over in the Greenville country last week, we gathered some mining notes which indicates that that section is sound in the quartz line, and sure to show well in results in the future. Much prospecting has been done in the past few months, and many ledges have been found which only await the necessary capital to open and develop them, to make them paying enterprises. Quite a large number have been opened, and among these the Soda creek mines are in the lead. First on the list is the Plumas National company's mine and mill. This is the location made by Ellis & Lowery, and sold to Lawrence and Reed. The new mill is now at work, and the results are very flattering indeed, the rock paying from \$14 to \$15 per ton, with ordinary stamps and batteries. Of course nothing but free gold is saved in this process. Fully 3% of the rock is sulphurets, and assays have proven them to be worth hundreds of dollars per ton. The company have ordered eight of Hendy's concentrators, four of Hendy's ore-feeders, and a supply of pans and settlers—\$7,000 worth in all—which are now on the road, and will soon be up and running. The company propose to make the mill worthy of the mine, which gives every assurance of being one of the best in the county. The vein is a true fissure vein, in slate walls, and carries an average width of six feet. It is thought the rock, when the new machinery is in, will pay regularly, upwards of \$20 per ton.

A short distance from the Plumas National is the location of Compton, Williams & McBeth, a fine ledge, and showing better and better as the work of development goes on. No mill has yet been put up, but a crushing of 125 tons of the rock has recently been made in the Kettle mill at Cherokee, which resulted in an average of \$13 per ton. The rock was taken out while prospecting, and was not the best in the mine. With good machinery and everything in running order, it is thought that it can be made to work up to \$20 per ton, and possibly more.

The old Indian Valley mine is under the management of Mr. Jno. Blood, who is "reconstructing" it, and putting it in shape for a permanent working. This mine was badly worked, and, as will be remembered, caved several times, once with loss of life. It is known that a portion of it never was worked, and when again opened in good shape, it will pay big dividends to the future owners.

At Wolf creek much labor is being done, with good results. The Wisconsin mine is showing well—14 feet of pay rock, and the 10-stamp mill now in operation, shows it to be worth \$9 per ton.

The Gold Stripe company have their mine in good condition for winter, and it is said by good judges that the ledge never looked better. They have a very large vein, a part of which is rich, the balance being "low grade." They "breast" it all out and crush it altogether, which brings down the figures, and in the judgment of some good miners, is not the way to work it. But one thing is certain, it has proved itself a valuable mine, and promises to last for several years to come.

Mr. Blake, a San Francisco capitalist, has purchased an eight-stamp mill from the Gold Stripe company, and intends to work rock from the Wilson mine, which, we are informed, he has recently purchased for \$16,000. This mine is near the Gold Stripe, and is certainly valuable.

Messrs. Vance, Peck & Coble, and Levi Austin have opened lodes on the north side of Clear creek, which show free gold and promise well.

Quite a number of "prospects" are being made, some with flattering indications, and the evidences of a future prosperity for the Greenville quartz miners, are plenty. We wish them the best of good fortune, for much depends on their being successful.—*Plumas National*.

**PLIOCENE.**—We visited the Pliocene works a few days since, and found the work of getting ready for winter advancing rapidly. The buildings are all up except the boiler house, which was being erected as fast as men could do it. The boilers are set (two being used) and the smoke-stack up. Wood and lumber are coming in rapidly. The engine is on the ground and is said to be the one used at the Mechanics' fair of '66 to run all the machinery. It looks as though it might be powerful. The foundations for this machine, now being laid, are superb, consisting of huge square timbers. The good weather will enable the company to get in good order before snow comes, and it will be necessary to do so as it is a "snowy" country, to be sure. The company realize this fact, and have provided a dozen pairs of snowshoes, for the use of the workmen. The shaft is down 55 feet and substantially timbered. In the setting of the boilers they are using lava rock, and for lining the furnaces and finishing, they employ a soap-stone brought from Plum valley, which is worked to the desired shape and size with a hand saw, and appears to cut as easy as old cheese. It makes a handsome finish and is said to wear indefinitely. This company is doing a land-office business in the way of fitting up for a permanent work. If there is any gold in the channel they will find it, and when it is found they will be in a condition to take it out at a minimum of expense and with celerity.—*Mountain Messenger*.

## Useful Information.

## Finding Iron Ore with the Magnetic Needle.

Prof. Thalin has communicated to the Swedish Scientific Academy a paper of much importance on a new method of prospecting for iron ores by means of the magnetic needle, which is described as follows in the *Iron Age*: At a great number of points in a field which is to be prospected for attractive iron ore, the horizontal components between the magnetism of the earth and the distributing force of the ore deposit are measured, and with the aid of these observations isodynamic curves are laid down, from whose form and nature conclusions of the location and importance of the ore deposits are drawn. The instrument by which the above field operations are performed is called a magnetometer, and consists in its principal parts of a common tripod-compass graduated only into whole degrees. From the compass-box a horizontal arm extends, upon which the field magnet required for determining the direction can be laid in such a manner as to keep constantly the same distance from the movable needle. In addition to this, the instrument possesses a leveling apparatus and a diopter with tangent-screw. The diopter can be fastened to the horizontal arm. In using the instrument the needle of the compass is set on zero, while the deviation magnet is left loose; after the latter again occupies its former position the angle of deviation is read. In order to be able to arrive at accurate conclusions about the location of the ore deposit, a great many of these observations must be made. For this purpose, the field is first subdivided into squares, with sides about 100 feet long, after which, at each corner, observations of the intensity are taken. It is easily ascertained whether more readings will be required at intermediate points. After these measurements are plotted, the points of equal angles of deviation are to be connected. These isodynamic curves are in an ore field usually closed lines, and they group around two distinct points. One of these points is situated north of the ore deposit. It is determined by an angle which is greater than any other, and which is called the maximum angle; the other point is situated in a southern direction, and determined by an angle smaller than any other, and which is therefore called the minimum angle. The former point corresponds to the least intensity, and the latter to the greatest. Underneath the connecting lines of these two points, which Thalin calls the magnetic meridian of the ore field, the most important portion of the ore deposit is, in general, to be expected. This method, in its application to prospecting, for attractive ores, has proved to be very useful, and at several places magnetic maps have already been delineated.

**TO REMOVE MILDEW.**—Wet the spot in lemon juice, then spread over it soft soap and chalk mixed together, and spread where the hottest rays of the sun will beat upon it for half an hour, if not entirely removed repeat the same. Or wet in clear lemon juice and lay in the sun; or soak for an hour or two, and then spread in the sun. Or mix soft soap, powdered starch and half as much salt together, and moisten quite freely with lemon juice. Spread this on both sides of the spots and spread in the sun. As soon as dried wet the spots again with the same mixture, lay in the sun and repeat the operation till the spots disappear. If newly spotted once wetting will be sufficient. Or wet the spots in chloride of lime just dissolved in water, and spread in the sun only a few minutes, then rinse. Repeat if the mildew is not all removed; but do not let this preparation remain but a few minutes at a time before rinsing, even if the process has to be repeated several times, as chloride of lime will injure the cloth if left on long.

**THE BLEACHING OF SPONGES.**—As the bleaching of sponges by means of sulphurous acid or chlorine is injurious to the health of the operator, a writer in a foreign journal recommends a process in which no noxious gases of any kind are evolved. The sponges are first soaked in hydrochloric acid to remove the lime, then washed with water, and immersed in a 2% solution of potassium permanganate. When taken out they appear brown, from the despotism of manganese oxide, which must now be removed by steeping them about two minutes in a 2% solution of oxalic acid, to which a little sulphuric acid has been added. As soon as the sponges appear white, they are well washed out with water, to remove the acid. Strongly diluted sulphuric acid may be used in the place of the oxalic acid.

**HOW TO DISTINGUISH STEEL FROM IRON TOOLS.**—It is impossible to distinguish between iron and steel tools; they have the same polish, the same workmanship; use will commonly alone show the difference. To make this distinction quickly, place the tool upon a stone and drop upon it some diluted nitric acid (four parts of water to one of acid). If the tool remains clean, it is of iron; while if of steel it will show a black spot where touched by the acid; these spots can easily be rubbed off.

**ENGRAVING ON SILVER.**—Cover the silver-plate with wax, engrave into the wax down to the metal, pour nitric acid on the plate, allow the acid to corrode the metal, wash off and remove the wax.

**MICROSCOPIC EXAMINATION OF FLOUR.**—To ascertain whether there are *acar*i in a specimen of flour M. Troupeau in the *Journal of Chemistry* recommends to place some of the flour between two sheets of paper, and thin it out by pressure with the finger. If *acar*i are present they soon reveal their existence by appearing as small molecules, visible to the naked eye. These may be transferred by means of a moistened point to the stage of the microscope. To study the legs and hairs of *acar*i it is indispensable to use a mixture of glycerine and acetic acid, which increases the transparency. To avoid bruising the insect a hair should be placed between the plate and the cover-glass. Examining in this way a number of specimens of flour, of various source and age, M. Troupeau has found that nearly all have contained *acar*i, and that these animals are more abundant the longer the flour has been exposed to the action of air and moisture.

**OZONE FROM FOUNTAINS.**—That fountains are ornamental no one disputes, but according to a paper read by Mr. Binney before the Manchester (Eng.) Literary and Philosophical Society, they have also an important sanitary utility. He contends that the atmosphere of towns may be "sensibly ozonized and improved in quality" by their action. He says: "A water fountain may be regarded as a hydro-electric machine, the friction of the water issuing through the jets developing electric action, materially assisted by the conversion of the spray into aqueous vapor. I would suggest that this fact should be prominently brought before municipal bodies, to induce them to erect fountains in all available places in large cities as sanitary agents. They might prove highly beneficial in crowded localities." The subject of ozone, in its various phases, is engaging the attention of many scientific inquirers.

**FASTENING INDIA RUBBER ON METALS.**—A mastic for fastening India rubber on metals may be obtained by steeping gum-lac, in the form of pulverized scales, in 10 times its weight of concentrated ammonia. A transparent mass is thus formed, which, at the end of three or four weeks, becomes fluid without the use of warm water. This substance, applied on India rubber, becomes hard, and completely impervious to liquids and gases.

**AT YOUR OWN RISK ON THE TRACKS.**—The Supreme Court of Michigan decides that railroad companies are not responsible in damages for injury to persons voluntarily exposing themselves to danger by walking on the track. In such a case the negligence of the person injured contributes to the injury, and the court should instruct the jury that the plaintiff is not entitled to recover.

**GUM TREES IN JAMAICA.**—The eucalyptus globules planted in Jamaica some six years ago, have acclimatized themselves so thoroughly on the plateaus of this island that many have attained a height of 60 feet, with a trunk of one foot diameter near the earth. They do not prosper in the low lands of the island.

## GOOD HEALTH.

## Reliable Remedy for Ringworm.

**EDITORS PRESS:**—Several children in this neighborhood have been troubled this season with that curious and unsightly tetter known as "ringworm." Probably what is common in Monterey is common throughout the State, only "rather more so," as our climate is exceptionally salubrious. I judge, therefore, many of your readers may be glad to hear of a simple, effective remedy for the above disease. Take a piece of bluestone (sulphate of copper), and having wetted it in water, gently touch the whole of the affected surface, being careful to circumscribe the outer circumference. One application will probably be sufficient.

If the scalp is the seat of the disorder applications of strong vinegar, as hot as it can be borne, twice or thrice daily, may be preferable to the bluestone. Unctions dressings are worse than useless. EDWARD BERTICK.

Monterey, Cal.

## How to Treat and Avoid Diphtheria.

The State Board of Health has issued a timely address to the people of the State on the continued prevalence of diphtheria in the State, and an apparent increase in some localities, and calls attention to precautionary measures. When diphtheria appears in a family, precautions commonly taken to prevent communication of the sick with the well should be adopted. A person being attacked with the disease, access to the room should be prohibited to all except those in the capacity of nurses. Other children should not be allowed to visit the house, and the same rule might be judiciously applied to adults. The room of the patient should be well ventilated. All woolen clothes, curtains, and where practicable, carpets should be removed therefrom. The saliva and expectoration of the sick should be kept disinfected by requiring the vessels used to receive them, to contain a little of one of the disinfectant solutions. The clothes removed from the body of the patient, as well as the bed linen, when changed, should be immediately dipped in boiling water, to which should be added to every gallon one ounce of the sulphate of zinc, or half an ounce of chloride of

zinc or condis fluid. Chloride of lime, sulphate of iron and common copperas are objectionable, as the former, if used of sufficient strength, will injure the fabric, and the latter will stain it. The funerals of those dying of this disease should not be attended by children. There is reason to believe that diphtheria may be communicated in the school room, the liability being increased by the fact that the disease may not be at once recognized by parents, who consequently exercise no restraint upon the attendance of their children. There cannot be too much caution used to avoid this too common method of disseminating this and other infectious diseases. After convalescence the child should be kept from the school until it attendance is considered safe by the physician. Cleanliness in and about dwellings; drawing off or providing a suitable receptacle for the waste water, slops, and accumulations in the kitchen; the cleaning and disinfection of cesspools, sewers and privies; and where drains into these lead from the interior of houses, the provision of a suitable trap, preventing the entrance of sewer gas, is of first importance, as the traps in use are often insecure, and we cannot too strongly urge the necessity of close attention to this subject. In addition to the trap the connection of a ventilating tube with the soil pipe, extending above the roof of the house, would afford yet greater security. Disinfection in such cases may be cheaply effected by the free use of sulphate of iron, copperas, or by chloride of lime. In towns which rely upon wells for drinking and culinary purposes, care should be taken to avoid their contamination by contiguous cesspools and other filth deposits. When diphtheria is suspected in a member of the family, send for the family physician, and under no circumstances rely upon the various nostrums or specifics so often published in the newspapers, or recommended by kind-hearted and ignorant advisers.

## A Peculiar Case of Lead Poisoning.

We learn from the *Medical Record* that a popular district of Paris has lately suffered from an epidemic of lead poisoning which presents some noteworthy features. Dr. Ducamp has had 65 of these cases under observation, and he made them the subject of a paper read before the *Société de Médecine Publique* on July 25th. The patients belonged to all classes of the population; in some families all the members, both old and young, were affected. After careful investigation, Dr. Ducamp found that all his patients were served from the same bakery, and, as he could positively exclude all other methods by which the poison could be introduced into the system, he came to the conclusion that the bread was the agent morbid. Chemical examination showed that it contained lead; it was evident, however, from the character of the baker, and from the fact that he and all his family were among the most severely affected victims, that the lead was not placed in the bread with criminal motives, while, on the other hand, the fact that the water and flour were the same as were used by the neighboring bakers, whose bread was not poisoned, showed that these substances were not toxic. Dr. Ducamp finally ascertained that the baker had been using old wood taken from demolished buildings to heat his ovens, and here he struck the root of the trouble. This wood had been repeatedly painted with white lead, and when it was consumed by the fire an oxide of lead was formed, which was deposited in a pulverized form on the floor of the oven. When the embers were withdrawn, and the bread put into the oven, the oxide of lead probably adhered to the bottom of the latter, and was removed with it. The correctness of this theory was confirmed by two striking facts: The persons whose duty it was to brush the bread, and who must have detached a portion of the lead and inhaled it in the form of dust, were the first to be affected and had the most severe attacks. Again, in one family there were two women, of whom one ate only the soft part of the bread while the other ate the crusts. The former escaped entirely, but the latter was attacked so severely that her life was in danger.

**THE NERVOUS PERSON.**—A writer in the *Journal of Chemistry* holds out some hope to nervous people who will make the effort. The nervous ones, made so by physical defects, contrive to secure a considerable amount of happiness and largely to influence the world for good. This is accomplished by a will power which in a measure dominates over bodily imperfections. This power can be cultivated and strengthened, and every nervous sufferer should strive to gain it and never yield to despair. Fight out your destiny, rise superior to your weakness; this is the text from which sermons cannot be too often preached. A nervous person exists in the world under great disadvantages. It is like being compelled to play a perfect tune with an imperfect instrument or to row a boat against wind and tide. Life is fitful, capricious and every step uncertain. One may be progressing pretty fairly to-day, but to-morrow the nervous currents are reversed and thick darkness rests upon everything. This is applicable only to the intense forms of nervousness, such as are often met with. There is hope for even these; not that congenital infirmities affecting the mind can be wholly restored, that is not to be expected, but by clearly comprehending the situation, exercising the will power and taking the best possible care of the imperfect body, life may be rendered, in a large measure, comfortable and useful.



# MINING SCIENTIFIC PRESS

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Saturday Morning, Nov. 17, 1877.

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## The Week.

The week has brought the "best rain of the season" in many parts. On the mountains the snow has fallen, and the crests which have been well high bare for nearly a year and a half, will soon, we trust, acquire a depth of covering which will yield abundant water for the streams and ditches during the year to come. Although the season is not yet far enough advanced to determine its several characters, the impression is that it will be a wet one. The hydraulic miners are all ready for active work, and in many places are actively washing down the banks. The sluices, flumes and ditches have all been repaired and put in order for the winter's work, and now that the water has come in abundance, the miners will begin to reap their harvests and repay themselves for many weary days of hard labor and "dead work." A good wet season will set California "on its legs again," and we are happy to believe that the signs point that way.

The *Coso Mining News*, a valuable exchange which pays careful and intelligent attention to the local mining interests of Inyo county, has entered its third volume.

The Leopard mine produced \$18,584 in October, the net yield being \$16,735.

The Grand Prize mine produced in October \$117,444, the net yield being \$105,689.

## The Engines for the California Street Wire Railroad.

The California Street Hill Wire Rope railroad, to be operated on the same general principle as the Clay Street Hill railroad, will shortly be in operation, the machinery for working it being nearly completed. The engines will be placed at the corner of Larkin and California streets, for operating the endless wire rope by which the cars are moved.

We had an opportunity of examining this week, at the Hope Iron Works, on the Potrero, the engines for this work. They are very heavy and strong and made in the best manner. The engines are upright inverted engines, with cylinders 22 inches in diameter and 30-inch stroke. They are calculated to work at about 90 revolutions per minute, and can be worked up to 250-horse power. There is a pair of these engines, so that either one or both may be used, and in case of damage to one the other is fully capable of doing all the work. Piston valves are used which have separate chests for steam and exhaust. The valve motion is operated by stationary link. The governor is attached directly to the steam valve rod and varies the point of cut-off according to the duty required. The Porter governor is used and is so arranged as to apply to either or both engines.

The bed plate for each engine is cast separate, and they are bolted together; on them stand the columns which support the cylinders. The bed plates weigh about six tons each and the frames for each engine also weigh six tons. The cylinders and steam chests weigh about four tons for each engine. The shafts weigh a ton and a half a piece. The crank disks weigh four tons each and are six feet in diameter. The fly wheels weigh six tons each, and are nine feet in diameter. The two driving pinions on the engine shaft weigh two and a half tons each. They are four and a half feet in diameter, eighteen and a half inch face, and three and a half inch pitch. The engine shaft is nine and a half inches in diameter.

The engines have all brass bearings, there being about a ton of the best quality of brass castings in the two engines. All complete, the engines weigh combined upwards of 60 tons.

They are to be placed in an excavation under the sidewalk at the corner of Larkin street, and the main shaft will extend out to the middle of California street, where the main driving gears are in line with the center of the railroad track. This obviates the necessity of bringing the wire cable at right angles from its general line. The whole arrangement is under the charge of Henry Root, who is the chief engineer of the road. Mr. Hanscom has done all the work on the engines at the Hope Iron Works, except the heavy shafting, which was made at the railroad shops at Sacramento. The foundry has been engaged entirely on this work for about five months past. The wrought-iron work on the road was done by the Pacific Rolling Mills, and McAfee & Spiers built the three boilers (locomotive style) which are now being put in place.

The engines stand 12 feet high. The bed-plates will be 20 feet below the sidewalk, and are to be set in brick and cement. The engines are plainly made, with no extra finish, the valve gear alone being highly finished. They will be entirely completed in about three weeks.

## An Unjust Rule.

In ordinary business transactions, and according to strict law, if a person pays a sum of money to another and afterwards changes his mind about the disposition he originally intended to make of it, the person to whom the money is paid is held to be a depositary in trust and is bound to return the money to the depositor on demand, or dispose of it in accordance with his order, upon the proper indemnification of the depositor for the trouble and losses, if any, which he has sustained by such change of determination. The person, who in the absence of a specific contract to that effect, should attempt to retain, as a forfeit, money paid to him, because the depositor had changed his mind, in regard to the particular use he wished to apply it to, could be compelled by law to return it to the payer. Nevertheless, while this is the law for the people, it seems that our Patent Office officials do not recognize it as being applicable to Patent Office proceedings. By the office rule if an inventor pays into the United States Treasury the first Government fee, amounting to \$15, to be applied on an application for a patent on a specific invention, and either, through inability to proceed further, or because he discovers that his invention is old or not practicable, or if he fails to proceed further for any other reason, the office refuses to return him either the whole or any portion of the money. It does not even give him the Jew's privilege of "taking it out in trade" by applying it on a subsequent application. Whether this forfeiture of an inventor's money is regarded by the office in the light of a punishment or as a lesson for his future benefit we do not know. We do know, however, that the rule is an unjust one, and works a great hardship to inventors. We know of a number of instances where parties have, through ignorance, deposited the first Government fee, under the impression that they were thus pro-

tected, while they tested their inventions. If the final result of their experiments should not be satisfactory, their money is forfeited and cannot by any means be recovered or applied on a subsequent case, although the Government has returned them no equivalent therefor. This looks very much like what we call a "gouge game." It certainly is contrary to the law that money paid without a consideration therefor, can be recovered.

## Another Dry Placer Machine.

During the past month we have referred to two different machines applicable to working dry diggings, and this week we saw still another, apparently simpler than either of those before spoken of. The one in question is the invention of J. C. McCurdy, an old Montana miner, who has it in operation in a blacksmith shop on Jessie street, between New Montgomery and Second streets, at the rear of the Grand hotel.

The machine is about the size of an ordinary ore feeder, but narrower, and is made so as to be taken apart for transportation on mules. It weighs altogether about 500 pounds, and is operated by crank motion, one man being able to run it easily. The dirt is fed on an inclined screen which separates the larger particles, the finer falling on to an inclined table about 20 inches wide by four feet long. This table is covered with sheet iron. When the dirt falls on the upper end of the table it passes under a kind of agitator or stirrer, which consists of a square board with spikes two and one-fourth inches long, passing through it from above. The points of these spikes rest on the table, and the lateral motion imparted to the board has the effect of stirring up and disintegrating the lumps of dirt. Passing under and through these spikes the dirt then comes to five mullers. These are composed of half oval bars of iron flat on the under side and pointed at the upper end, which fit snugly to the bed or table. They lie lengthwise the table, and a lateral motion is imparted to them the same as to the board and spikes. They keep the material loose and broken so that the heavy and fine particles settle to the bottom. The lower ends of these mullers have upright iron spikes projecting upwards to clear the debris and assist in discharging it over the end of the machine at the riffle.

The table itself is hung at each corner on galvanized iron wire cord, and the revolution of the crank imparts to it a forward and back shaking motion, while the mullers and spikes have only a lateral motion. It is intended as far as possible to imitate the motion of a miner's pan. A simple arrangement admits of regulating the inclination of the table as desired. At the lower end of the table a tail-board is placed which forms a riffle, and the space between the table and tail-board allows the concentrated earth to pass back under the machine to the ground, while the debris goes over the end of the machine.

One of these machines made in a rude manner was tested practically in Montana, entirely to the inventor's satisfaction, and he has come here for the purpose of introducing them where he has the facilities for cheap manufacture. There is very little cast iron work about the whole thing, the idea having been kept prominently in view to make it as simple as possible, and put nothing on which could not be repaired by any ordinary blacksmith. The only casting used is the gear wheel on the crank shaft. It can be used advantageously not only in dry diggings, but where there is say two and one-half inches of water, in which case the inventor says it will do as much work as 70 inches will in sluices. By using this small amount of water a slight modification is necessary, but the owner can clean up every night.

In working dry dirt the idea is to concentrate say 100 yards into one, and then pack the one off to water and wash it. If necessary this can be put through again and re-concentrated to still less bulk before washing. The machine will work, dry, in a day, about what one man would shovel, or more according to the size of the machine.

They are to be made with bed plates from 16 to 30 inches wide, and will be sold at from \$400 or less, according to size and capacity. While we examined the machine the inventor passed through it a quantity of talc slate, dirt and rock, containing a few small flattened shot. The fine material and shot settled to the bottom before reaching the end of the plate, and fell back under the machine through the aperture, while the coarser part passed over. The machine is hauled, like all concentrators, on the principles of specific gravity, and the dirt is simply kept loose so that the fine and heavy material can settle down as the whole passes through. The power required to run the machine with a 20-inch bed plate is no more than a man would expend in shoveling all day. Those interested in this class of machines will do well to examine it in operation at the place indicated above, or the inventor can be addressed at the drug store, N. W. corner Second and Howard streets. Many places in California, Arizona, New Mexico, Sonora and elsewhere could be made to pay handsomely with a machine of this character, which have been heretofore untouched on account of a lack of water. Mr. McCurdy has spent considerable time in perfecting this machine and has delayed introducing it until he had practically tested its merits to his satisfaction.

## The White Patent Furnace.

A decision involving the title to one-fourth interest in the White patent rotary furnace was recently made by Judge Wheeler in the Nineteenth District Court. This White patent furnace is the original inclined revolving cylinder furnace, patented in 1864-5; being continuous in its operation, and is rapidly growing in favor for roasting and chloridizing silver ores, and on this account a number of spurious imitations have at different times since the patents were issued, been attempted to be introduced, but all embracing its main features, which are essential for the successful treatment of the ores.

It is on account of the importance and value of this furnace to the mining public that we make known the facts concerning the title to the patents. The action was brought by James M. Thompson against George W. White to compel White to convey a one-fourth interest in the patent for said furnace, and decided by Judge Wheeler in favor of the plaintiff.

On Feb. 13th, 1875, Thompson agreed to loan White \$1,000 to aid in erecting a furnace in this city, for which White agreed to give his notes and to pay them at the end of 16 months. Should Thompson not elect to purchase one-quarter interest in the patents then the \$1,000 to be loaned was to apply as a payment on the purchase of the interest at \$5,000, the balance of \$4,000 to be paid out of the first profits of the interest for two years, or until they reach that amount. The facts brought out by the evidence, at the trial of the case, showed that White purposely kept out of the way when Thompson was looking for him to tender his notes and demand his conveyance of the interest, and that he had, from the first, intended, if possible, to avoid making the conveyance to Thompson.

The decision which has the effect of vesting in Thompson one-fourth interest in the entire furnace patents, is a favorable one for the mining public, for with the important improvements which he has made in the furnace, as well as also its improved mechanical construction, as made at the Pacific Iron Works in this city; the defects in the furnace, as heretofore constructed by White, are entirely overcome, and its action is very much improved, as well as its capacity and economy of operation greatly increased, and it is probable that the furnace, as constructed at the Pacific Iron Works, under Thompson's license will constantly grow in favor, as its merits over other roasting furnaces of this description become more generally known.

A peculiar feature of the patent law, which we have frequently stated before (see John L. Boone's articles on patents and patent law), and which we will again make known for the benefit of our readers, was referred to by the learned Judge in giving his decision of the case. This is, that joint owners of patent rights are not necessarily partners, and that each of them, no matter how great or how small his interest, has the right to act independently of, and without accounting to the other owners, and that purchasers of patent articles from a joint owner of however great or small an interest in the patent, have as full right to the same as purchasers from exclusive owners of an entire patent would have.

The Judge, in reviewing the case, said men who advance money to inventors assume great risks, and have some rights. Thompson came forward with his \$1,000 and assisted White in an invention that he (White) had been working on for 11 years. He took the risk and had a right to share in the profits. The defendant contended further that it would be unjust to convey a fourth interest, as a man might as well own nine-tenths as one-fourth, because with any interest whatever he could proceed with the manufacture and sale of the furnaces. The court observed that counsel had replied with great mathematical precision to this objection by holding "if one-fourth is equal to the whole, three-fourths is not less than the whole." The court found in the evidence that this objection had no force, as a man in New York was also owner of a fourth interest, and concluded by saying: "Thompson's claim is meritorious both in law and equity, and the decree is in favor of the plaintiff."

COMSTOCK BULLION.—According to a statement made to the Assessor, the quantity of ore and gross value of the bullion produced in Storey county, Nevada, for the quarter ending September 30th were as follows:

Mines.	Tons.	Average.	Bullion.
Andes.....	936	\$15	\$14,000
Belcher.....	2,685	24	64,000
California.....	55,180	75	4,337,200
Con. Virginia.....	49,681	106	5,223,200
Chollar-Potosi.....	5,282	15	\$1,800
Justice.....	34,285	17	598,200
Ophir.....	1,407	21	31,100
Stevenson C. C.....	3,967	13	55,300
Totals.....	\$147,459	\$64	\$9,505,000

The Silver King mine of Arizona, has been listed at the S. F. Stock and Exchange Board. Other Arizona mines will soon be called in the same board.

The Manhattan mines have paid \$400,000 in dividends, without the levy of a single assessment.



## HYDRAULIC MINING IN CALIFORNIA.\*

No. 6

(By A. C. J. BOWIE, JR., A. B., Mining Engineer.)

## Flumes and their Construction.

In crossing ravines, flumes or wrought iron pipes are used. Many miners object to flumes on account of their continual cost and danger of destruction by fire. Where used, and practicable, they are set on heavier grades than ditches, 30 to 35 feet per mile, and, consequently, are proportionately of smaller area than the ditches. In their construction a straight line is the most desirable. Curves, where required, should be carefully set, so that the flume may discharge its maximum quantity. Many ditches in California have miles of fluming. The annexed

one of better make on which the round seams are made with rivets three-quarters of an inch apart, and the longitudinal seams are double riveted with rivets one inch apart in the row, and with about one-half inch apart from one row to the other. If riveted with care such pipes, after being dipped in an asphaltum bath, are excellent and will last for many years. For the asphaltum bath the following preparation can be used:

Crude asphaltum..... 25.  
Coal tar (free from oily substances)..... 72.  
Or,  
Refined asphaltum..... 164.  
Coal tar (free from oily substances)..... 83.

When the mass has been boiled to a proper consistency, and by test the coating is found to be brittle, it at once indicates that the mixture

The following table shows the usual distances of rivets for corresponding thickness of iron; items relate to 22-inch wrought-iron pipe:

Thickness of the iron	Diameter of the rivets	Length of the rivets	Pitch of the rivets	No. of rivets in each circle seam.	Pitch of the rivets in the longitudinal seams or double row.	Width between the centers of the rivets in the double row.
No. 12 5-16 in	5/8 in	1 in	1 in	60	1 1/2 in	1 1/2 in
No. 11 5-16 in	5/8 in	1 in	1 in	60	1 1/2 in	1 1/2 in
No. 9 3-16 in	3/4 in	1 1/2 in	1 1/2 in	60	1 7-16 in full	1 1-16 in
No. 8 1/2 in	3/4 in	1 1/2 in	1 7-16 in	39	1 11-16 in full	1 1-16 in
No. 7 1/2 in	3/4 in	1 1/2 in	1 7-16 in	39	1 11-16 in full	1 1-16 in



## Reducing Ores.

Quite a remarkable fact seems to have become apparent lately in the reduction of gold bearing quartz, namely: That a process which acts admirably with a small quantity of rock, will not give proportionate results with a large quantity. There is more than a rumor afloat that the Monnier process at the Providence mine is somewhat of a failure in its present stage of development, though what may be attained in the future may far exceed the highest anticipations of its intelligent inventor. And this supposition is confirmed by the report that a large sized stamp mill is to be erected on the site of the present hoisting works. Yet this process worked exceedingly well with a small quantity of quartz, and so confident were the proprietors of the Providence of its complete success, that they invested thousands on thousands in adapting it for the reduction of their ore. What the cause of the failure is, cannot be accurately ascertained at present. It is possible it may be in the direction of the chemical law of equivalents; it being far more difficult to accurately weigh and combine large quantities of rock and the necessary chemicals, than small quantities of the same. But whatever the cause, the fact stubbornly remains, and must of necessity be considered, especially in all attempts at the reduction of obstinate ores. We see that some enterprising man has, in his own opinion, discovered a process for the successful reduction of the rock of the Meadow Lake mines, and reasons that because a small quantity has been well worked by the process, therefore, as a matter of course, a large quantity can be just as well worked. May there not be room for a great mistake here, and would it not be well before going to great expense in the erection of works to be certain of the efficacy of the method in regard to a comparatively large portion of rock? Perhaps it is in this as in chicken raising. A small number of chickens or hens will do first rate, and grow and lay well, but if the experiment be tried with a very large number, it signifies little; or as an author may find that an article, poem or address will sound very well before a small company of friends, and he received by them with much applause and commendation, which, before a large miscellaneous audience, would fall dead and meet only with hisses and contempt. It is possible that there is a law which necessarily prevents enormous success in the generality of mining enterprises as well as in other matters, and that it is better for us that slower and more laborious methods be adopted. It is certain that we need more of the cool, plodding perseverance exhibited in the business of mining in the old countries, before our mines are developed to the extent, and with the thoroughness that they should be.—*Nevada Transcript*.

## Mining Enterprises in Oregon.

A correspondent of the *Oregonian*, speaking of enterprises in eastern Oregon, says: If the rains hold off for two or three weeks more, several of the mining ditches, in course of construction, will be completed to the gravel deposits and ready to commence operations. The Sterling ditch, under the energetic management of Gov. D. P. Thompson, is rapidly nearing completion. The construction of the flumes along the line is all that remains unfinished, the lum is being floated down the ditch as rapidly as possible to complete this part of the work. Men are engaged making and laying the pipes and constructing the water distributor above the ground where the piping will be commenced. Since my last communication to the *Oregonian* another extensive ditch has been commenced on Big Applegate creek, 25 miles south of Sterling. Dr. J. C. Hawthorne and Judge J. H. Reed, of your city, are interested in this work, and the ground it is proposed to mine is reputed to be rich and extensive. About two weeks ago Gov. Thompson turned over 200 Chinamen to the new company, their labor not being required longer by the Sterling company. This work is now being pushed forward with all possible dispatch, in order, if possible, to attain completion before the rainy season sets in. Judge Tolman is pushing the work forward with great energy on his Cow creek ditch. He has already reached the first gravel deposit on his line, from the head of the ditch, and will heready to commence mining as soon as his pipes, flumes and other apparatus are on the ground. The mining companies of Josephine county are all in readiness for water, and if the coming winter brings the usual supply, there is a very flattering promise of better times throughout this part of the State. Indeed, if the mining enterprises now inaugurated in Jackson, Josephine and Douglas counties prove successful, they will but introduce an era of prosperity that will last for many years. There are many other localities where vast deposits of gravel are found which yield paying prospects and require only capital—to bring in water—to be made to pay large dividends to shareholders. The prospect for the "good time coming," foreshadowed by the development of the mines, affords a more cheerful outlook to all classes of people.

A NEW MILL.—Jurien Scott and Peter Spray are having a five-stamp mill erected on their mine in Indian district, six or eight miles south of Unionville. All the castings and the greater part of the machinery of the mill were made at the Mill City foundry.

## Beet Sugar in California.

While the beet sugar industry is showing decreased production this year in France, owing to a season unfavorable to the growth of the material, it is gratifying to know that one of the California factories is going forward with its business rapidly and distributing considerable sums of money to the beet growers. The factory at Soquel, Santa Cruz county, is running to its full capacity, and we are glad to get from the *Santa Cruz Courier* some interesting statements concerning it. The sugar company only cultivated 100 acres of beets themselves this year, gathering therefrom 1,000 tons of the roots. Charles Knapp, of Watsonville, had the contract for furnishing the 5,000 tons of beets, which were raised in the Pajaro valley, for the factory. The land in that valley seems especially adapted to this culture, in some cases yielding as high as 25 tons to the acre and averaging 20 all round. At \$4.75 per ton—the price paid the cultivators—the average return from the land in this crop was \$95 per acre. The year's work will throw \$25,000 into the Pajaro valley on this crop alone. As the rainy season is coming on, the factory is rushing in two train loads, of 20 cars each, of beets every day, the surplus over the amount necessary to run the factory each day, 13 car loads, being piled alongside the switch for future use. Mr. Hihn, has the contract for furnishing the wood for the establishment—3,500 cords per year at \$3 per cord. Dr. Flint is keeping 300 head of cattle in the immediate vicinity of the works, to which is fed the pulp left of the beets after the saccharine has been extracted. Next year either Dr. Flint, or the sugar company will probably run a dairy for the purpose of turning this pulp to the best advantage. The market for the beet sugar this year is as good as the average. The mill is running at full capacity, and will not shut down until after the first of January. It is now turning out about 70 cents or three and one-half tons daily, nearly all of which is shipped to San Francisco. Directly and indirectly, about 160 men obtain employment through the running of this establishment, and about \$75,000 a year is paid out in this county by it. The company has \$250,000 invested, which pays a good dividend. Another vacuum pan will be added to the factory this winter for the next year's run.

THE NEQUILLA MINE.—The Arizona *Citizen* announces the conditional sale of the Nequilla mine, near Tucson, to San Francisco parties—Clinton Gurnee, Esq., being the negotiator. The property belongs to Messrs. W. F. Scott and James Lee, and was the first mine for which a United States patent was obtained in Arizona. In a straight line it is perhaps not above 12 miles from town, and by a very fair road, about 15. About five years ago work was suspended on the mine. The last done was that of sending several tons of the ore to San Francisco for reduction, which, if we rightly remember, gave a net yield to the shippers of about \$90 to the ton. The vein is opened up to a depth of 120 feet. It seems to be a clearly defined lode, varying in width from one to five or six feet. There are springs of water near the mine, and a passable wagon road to it. The price to be paid for the mine is \$20,000 if the sale is finally perfected, a fact dependent upon its development.

RICH MINES NEAR IONE.—J. B. Cooper, one of the owners of the series of mines situated about eight miles south of Ione, Nye county, recently purchased by a party of San Francisco capitalists and now being worked under the superintendence of M. San Pedro, arrived in town yesterday from the mines and left on the Battle Mountain stage, en route for San Francisco. He had with him a large bar of silver, the product of a comparatively small quantity of ore from the mines. He stated that the mines are emphatically a big thing, the ledge being eight feet in width, of free milling ore. Ten men are now employed in developing the mines and taking out ore, the work so far done on the mines being merely superficial, but enough to demonstrate that their prospects are big.—*Reese River Reveille*.

RICH discoveries are being made, almost daily, in the locality about three miles westerly from the Silver King. Within the last month several rich discoveries have been made about three miles east of Mineral creek and about 10 miles north of the Gila river. The principal mines in that locality are the Monitor and the Great Republic, which have ledges from four to six feet in width, the ore assaying all the way from \$300 to \$700 to the ton. Both these claims are being rapidly developed. C. G. Mason, of King notoriety, is an owner in the Great Republic, and is pushing the work on the mine with his accustomed energy and determination.—*Arizona Citizen*.

WOODWARD'S GARDENS has the following new attractions: The buffalo chase; large whale skeleton; new museum; improvements in the zoological department, besides the other features which have made it popular.

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## UNITED STATES Mineral Land Laws, Revised Statutes, AND INSTRUCTIONS AND FORMS UNDER THE SAME.

We have just issued a pamphlet containing the General Mineral Land Laws of the United States, with instructions of the Commissioner of the Land Office. The contents of this pamphlet comprise all of the Government laws with relation to mineral lands of interest to the mining community, as follows: Mining Statute of May 10th, 1872, with Instructions by the Commissioner of the Land Office; Mining Statute of July 26th, 1866; Mining Statute of July 9th, 1870. Forms required under Mining Act of May 10th, 1872, as follows: Notice of Location; Request for Survey; Application for Patent; Proof of Posting Notice and Diagram of the Claim; Proof that Plat and Notice remained Posted on Claim during Time of Publication; Agreement of Publisher; Proof of Publication; Affidavit of \$500 Improvements; Statement and Charge of Fees; Proof of Ownership and Possession in Case of Loss or absence of Mining Records; Affidavit of Citizenship; Certificate that No Suit is Pending; Power of Attorney; Protest and Adverse Claim; Non-Mineral Affidavit; Proof that no Known Veins Exist in a Placer Claim, etc. There is also given the U. S. Coal Land Law and Regulations thereunder. The work comprises thirty pages, and will be sold, post-free, for 50 cents. It should be in the hands of every one having any mining interests. DEWEY & CO., Publishers of the MINING AND SCIENTIFIC PRESS, S. F.

## Testing and Working Silver Ores.

The above is the title of an illustrated work of 114 pages, for miners and prospectors, by Chas. H. Aaron, which has just been issued by Dewey & Co. Mr. Aaron has managed to give many useful hints and suggestions, free from all technicalities, and in such a style as to be easily comprehended. It is written for the miner, with no chemical symbols or metallurgical technicalities to confuse those who are not chemists or metallurgists. The following summary of the contents of the work will give an idea of its scope:

Under the heading of the first chapter, "Testing Ores for Silver," we find paragraphs on ore formation test for silver, with heat and water, acid or blow pipe. In speaking of testing for a process, the extent and richness of ore is considered, smelting ores, selecting and working sample, appliances for testing, roasting, etc. Under the head of "Working Ores" the author describes Aaron's process, has something to say of superheated steam, preparation of dichloride of copper and protochloride of copper, use of copper and iron, quantity of chemicals, carbonate of lime, chloride ores, amalgam, Patches process, etc. He also describes the methods of working roasted ores, treatment of base metals, stirring, beat of furnace, want of sulphur, etc. Under the head of "Leaching Processes" are the titles, Smelting, Mexican process, Chilean process, Kroehne's process, etc. Under "Pulverizing Machines" are described the arastra and its construction and operation, stamp batteries, screens, Crocker's trip-hammer battery, Paul's pulverizing barrel, Kendall's battery, Noice's pulverizer, a cheap rock breaker, etc.

In speaking of amalgamators the author describes a cheap amalgamator, grinding the directions for making a barrel, preventing mechanical wear, use of quicksilver, copper in bars, Freiberg barrel, cheap barrel trough, barrel on rollers, Aaron's amalgamator, separator, etc.

He describes an improved retort, roasting furnace, furnace tools and furnace building. Among the miscellaneous mention may be found Aaron's leaching apparatus, with two of three different arrangements, a small mill, sampling tailings and settling tanks, dichloride of copper, etc. Mr. Aaron is a practical miner, of long working experience on this coast.

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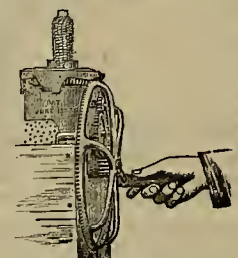
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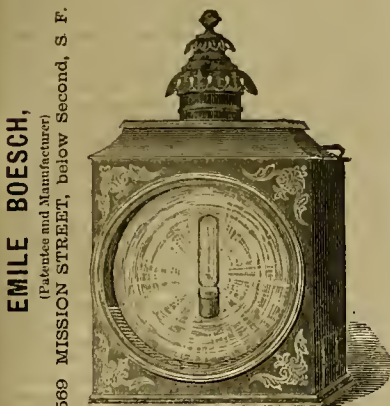
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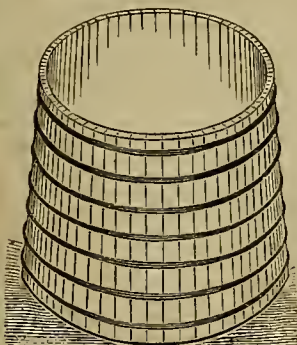
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Continued from Page 309.

followed to the tenth, and thence downward a further distance of 100 feet, is still apparently limitless in depth, and of immense proportions both in width and length. The bottom of the winze from the tenth level has attained a depth of 100 feet, and is still in ore. It is probable that a new level will be opened up at some future time, but at present the reserves in the upper levels are so vast that no necessity exists for that work. It is also probable that some radical changes in the present system of working will be inaugurated. Among the problems of the future, as the mines are explored to a greater depth, is the increased flow of water that will no doubt be encountered. With the exception of the K. K. Con., the Ruby Hill mines have not been troubled with this element in sufficient quantities to retard operations, but during the past week the influx into the Consolidated has been more than was ever before experienced, and its presence has proved an obstacle to the prosecution of prospecting. Ore extracting has progressed steadily since our last review, some 1,000 tons having been raised to the surface, the most of which has been transported to the reduction works. We are informed that the lower deposits—those on the tenth level—are a much higher grade than ever met with before. The ore is entirely free from any refractory elements, carries a high percentage of lead, and assays on an average very nearly \$100 per ton in gold and silver. This fact adds very materially to the value of the bullion, and is a most noteworthy feature.

**THIS JACKSON MINE.**—The following official letter gives a resume of operations at this mine. There is no change to be made in the drift on the 300-ft. level. The face is in soft line with bunches of low-grade ore interspersed through it. The drift south on the 400-ft. level is looking well; the ore seam still making in; made 21 feet since last report. Drift from winze is improving, as we advance. For the last two days the rock has got much softer. Since air pipes were put in the air is splendid, and we can carry the drift almost any distance. We are still raising some ore from the third slope in the ore winze. Started pumps yesterday, and both are working well. Pumped the sump dry in 15 minutes. Would have started shaft yesterday but was compelled to shut down to repair engine. Will be ready to start up this morning. Will put a three o'clock shift at work on the shaft. Do not anticipate any further trouble with the pumps.

### Arizona.

**DISCOVERY.**—*Arizona Enterprise*, Nov. 3: Al. Doyle and Dan Martin have made a discovery about a mile south of the Peerless, which gives promise of being a valuable piece of property. Some very rich ore is being taken out, and the vein is steadily widening. Work is about to commence on the Nifty, situated on the Hassayampa, near Frederick's mill. This is an old location, showing a strong and well-defined vein, and carrying some high grade ore—gold quartz.

We were shown, yesterday, some specimens from a late discovery south of the Davis mine in Hassayampa district. The ore is a sulphuret, and assays into the hundreds. The finder is Mr. Hauson.

**BULLION.**—The Peck company shipped this morning two bars of bullion, weighing 1,421.40 and 1,420 ounces, respectively, and valued at \$3,548.91. The total amount shipped by the company during the month of October will foot up to about \$30,000.

**TROUBLE AT THE MILL.**—Yesterday morning it was rumored that S. O. Frederick, of the Senator mill, had left for parts unknown, and subsequent investigation confirmed the fact. He was in town on Wednesday, when he brought in the week's clean-up from the mill, some \$2,000, which is about all he must have taken with him. He told Pat Hamilton and A. O. Noyes that he was going after shoes and dies for the mill, which he said were at Mr. Hitchcock's. He said he had been to the mill the day morning he could have been back by this time. From inquiries made we learn that his indebtedness will reach about \$100,000, a good part of which is due to the miners and mill men whom he had employed. C. P. Head & Co. are the heaviest losers, his indebtedness to them being something in the neighborhood of \$57,000. They have his note for \$23,915.00, on which they brought suit; and have also brought suit for the sum of \$84,596.80 for goods and merchandise sold to him. Bowers & Richards have a mortgage on the mill and other property for \$18,000. L. Bashford & Co. have brought suit for \$392.32. Several suits have been entered in Judge Carter's court.

**BRADSHAW.**—In the Bradshaw district the Tiger company are pushing down in a business-like manner, and evidently intend prospecting their mine thoroughly. They have comfortable and efficient hoisting works. There is nothing adventurous about the Tiger; they are laying the basis of a prosperity that will realize great fortunes. We learn that the Tiger mine is about to change hands. Arrangements are being made with the owners of ground adjoining the Discovery claim, with the view of purchasing their interests by the parties now operating on the mine.

**TIP-TOE.**—This tip-top is a lively camp. A shaft and three tunnels on each north and south hill are showing the mine rapidly and favorably, while the pay streak continues in richness and widens encouragingly. At the Foy mine very favorable chloride ore has been developed.

**GREENWOOD.**—By information received from Greenwood we learn that the Signal mill on the Sandy was ready to start up. On the trial run everything was found to work to perfection, and the company expected that the mill would commence running on Saturday. The capacity of the mill is 60 tons per day. The McCrackin company have the foundation for their new 20-stamp mill almost finished, and expect to have their mill in running order in about 60 or 70 days.

**PECK.**—The work on the new Peck mill is being pushed rapidly. Mortars, pans and settlers are in place, and in 30 days stamps will drop on ore from the Peck bonanza. The north tunnel of the Peck mine is in 60 feet beyond the south of the main shaft, showing on the face 20 inches of green ore, worth from \$300 to \$1,400 per ton. A shaft about 50 feet below the north tunnel is making good progress, and with a small force of men sufficient first-class ore is taken out to keep pack-trains running. On Saturday last a sufficient flow of water was obtained at the new mill for mill purposes.

On the May Bean (discovery) extension on the Peck a tunnel, under the able direction of R. J. Hubbard, is progressing rapidly, with the expectation of reaching the ore vein in a few weeks.

At the Black Warrior it is hard to tell who is doing the most work. Doc. Smith or the men in the shaft. The rapid work Doc. keeps picks and drills in shape and the energy he displays in sorting ore seems more like pleasure than labor. The ore, heavily impregnated with wire silver, is from their two feet wide, and indicates a vein as permanent as any in the country.

At the Doyle a contract has been let to sink a shaft to a depth of 100 feet, which is now down 50 feet, showing 8 to 14 inches of good metal, with good prospect of a healthy mine.

There are many good mines in the Peck district, on which work has been temporarily suspended, by reason of the owners doing assessment work on new locations in other districts.

**MCCRACKIN.**—*Arizona Miner*, Sept. 2: S. C. Miller returned on Saturday from the Big Sandy, where he, in connection with his brother, has large freighting contracts. The Signal mill company has a contract with the Miller Bros., extending over a period of 16 months, for the delivery of 10 tons of ore per day from their claim on the McCrackin lode to their mill on the Big Sandy, a distance of eight miles, for which they pay \$5 per ton, or an average of \$300. The Signal mill commenced operations on Saturday last, having on hand, at the dump of the mill, 300 tons of ore, while at the mine they have in sight several thousand tons in readiness to ship, therefore it will be easily conceived that this company have not only an excellent 10-stamp mill but they have also an abundance of ore wherewith to keep it busy. It is thought by those competent to judge that the Signal company will be able, at the least calculation, to ship \$30,000 per month from their works to the Mint in San Francisco, or about \$1,000,000 per annum. The McCrackin company, who are

now busy in the erection of a new 20-stamp mill, which will be completed in about 60 days and ready to commence its work of reducing the mountain ore discovered by Jackson McCrackin, from whom the mine derived its name, have also a contract with the Millers for the hauling of 100 tons of ore per day, commencing in about 60 days from the present time. Times on the Big Sandy are flourishing. New buildings are going up all along the Sandy for a distance of three miles, and the town has been appropriately named Scatterville.

### Idaho.

**WAGONTOWN.**—*Cor. Idaho Herald*, Sept. 2: The J. B. Dadds is yielding good ore in moderate quantities, being worked by Brunzell & Co. The Crown Prince, now owned and worked by Wilbur Harlan and Ryan, is turning out quantities of ore that is good for \$90 per ton. The ledge is six feet wide, the principal part of the metal being gold. Two men are "cayotting" about in the Henrietta mine, which turns out a very small quantity of as rich silver ore as can be found the accident which occurred some time ago. John mine also yields a small quantity of ore of the same character, and is being "cayotted" by two other miners. These two mines, together with the Maggie and Comstock, are situated in a small knoll between two main ridges, and their respective shafts form a little cluster within a radius of not more than 100 yards. The ore is found in spurs that shoot here and there through seams in the bedrock, and can only be successfully worked by men of experience in these particular mines. Silver is found in veins all over this hill and those on each side, but, as a general thing, in light quantities, the great mass yielding from \$35 down to \$12 per ton. There are thousands of tons of float rock on the surface that will yield from \$15 to \$40 per ton, and a number of men are engaged in gathering it, but it costs \$10 to haul and crush, and men cannot get rich gathering float. The ore from the Henrietta is worth from \$20 per ton to \$6 per pound, and cannot be worked by mill process here.

**OWTIE.**—Mining affairs in this county are wearing a more cheerful look than a year ago. The Poorman will start up shortly. The Potosi and Belle Peck and a number of smaller operations are being carried on successfully. The Black Jack mine, mention some time ago, has made a run of quite a number of tons of quartz that has paid well.

**SOUTH MOUNTAIN** is sure to revive sooner or later. There are some good ledges there of milling ore besides the large quantity of smelting ore known to exist in that mountain.

### Montana.

**THE DEXTER AND THE LEXINGTON.**—*Butte Miner*, Nov. 3: After being thoroughly repaired the Dexter mill was started up last Thursday, and has ever since been busy at work day and night. The accident which occurred some time ago to the Lexington is to be remedied by replacing the engine hitherto in use by a larger and more powerful one now on the way, and expected to reach Butte to-day or tomorrow. To set up the engine and make all the repairs required throughout, will take about two weeks, and after that date we may expect to see the Lexington working with its old-time regularity.

**MORE REMOVALS FROM VIBOND DISTRICT.**—We learn from Mr. Purvine that the milling facilities of the Vibond district will soon be largely increased, as two more arrastras and a five-stamp mill will shortly be added to the works now employed upon Vibond ore. Isaac Dodson will own the mill which he is now removing to Dewey's flat from the neighborhood of Radersburg. The arrastras will be owned, one by Allan Hay, the other by W. H. Brown. Mr. Hay's arrastra will be run by the engine of the Moose creek sawmill, which is soon to be brought to the flat, but Mr. Brown's will be a new one throughout. Both arrastras will be well provided with pans, settlers and all other appliances necessary in treating silver ore. The ditches to supply the water are already dug and it is expected that all three of the above works will be completed and ready for work long before spring.

### Coloma—The Site of Sutter's Mill.

Changed Conditions of a Historic Locality.

[Written for the PRESS.]

In no town along the great auriferous belt of California has the business of mining been so nearly extinguished as here at Coloma, the spot where gold was first discovered. Evidences of the former workings are, indeed, everywhere abundant, but not here, nor in the immediate vicinity, is gold gathering by any of its various methods now much engaged in. The great fields of cleau washed shingle, and the vast piles of glistening boulders seen on every band, attest how extensively gold washing was once been carried on; the young trees now growing in the deserted diggings denote how long a time has elapsed since this industry was actively prosecuted here. Instead of the old-time village, with its eager crowds and exciting scenes, Coloma is now a quiet, vine-embowered hamlet, with rustic homes and rural occupations. Almost every house is buried in a cloud of foliage, the thrifty and well-trained nurseries and shade trees standing like a forest about the place. Strangely, indeed, has everything in and about the town been changed. The historic mill is gone. The equally historic race, with the washing away of the bar through which it ran, has disappeared. The two tall pines that towered over the old structure, as shown in Nahl's famous picture, stand there no more. Only the hills around, with their scattered oaks and forests of pine, and the river rushing over its rocky bed, remain the same.

Sutter's Mill, Coloma, in the Month of March 1849.

It was the rudest sort of a camp, a score of log cabins and a few board shanties with some tents and Indian wickiups constituting the village proper. It was then a dull place, too, the population being made up of old 48ers, a class of men prone to take things easy and in no great haste to get rich. The most of them had gathered a good deal of gold dust the year before, but having done little the preceding winter, while the cost of living was great, the contents of their buckskin purses had, by this time, made their way pretty generally into the pockets of the local traders, the gamblers, too, very often coming in for a share. But then every man's credit was good, at least for all needed supplies of flour, beans, bacon, whisky, tobacco and like prime necessities. The inhabitants of the place were made up of American residents in California, including members of the Stephenson regiment, and of settlers from Oregon, with a sprinkling of sailors who had

left their ships in the port of San Francisco, adventurers from Mexico, Central and South America, Kanakas and such persons as happened to be sojourning in the country at the time of the gold discovery, the population of the camp amounting then to some 300 or 400. There were, at this date, several

Families Residing at the Mill.

Of these I remember James W. Marshall, the discoverer of gold, Peter Wimmer, and the Bennetts, Anthonys and the Packwoods, there being two families of the latter, brothers. There were also living here at that time William Huefner, now Marshal of the Pioneer Society in San Francisco, and for many years connected with the German newspaper press of that city; Charles E. Pickett, also a resident of San Francisco, often called, because of his pronounced and somewhat radical opinions on political and social subjects, Philosopher Pickett; Capt. Shannon, afterwards elected a member of the convention for framing the State Constitution; John T. Little, plying the vocation of real estate and money broker in San Francisco; Clarkson Dye, better known as Dr. Dye, an enterprising and ingenious New Yorker, having arrived at the mill along in the spring. Wimmer was with Marshall examining the mill race when the first piece of gold was found, it having been noticed by the two men at the same moment. Marshall, however, picked it up, and hence received the credit of being the finder, in so far, however, as any credit can attach to anything so purely accidental, it would appear to be due to Mrs. Wimmer, who, when the others were in doubt as to the character of the stuff, declared it to be gold as soon as she set her eyes upon it, proceeding to make what was supposed to be a crucial test of its qualities by throwing it into her soap kettle to see if it would tarnish. As it did not, after lying there over night, it was admitted on all hands that it must be gold. Among other parties who had wintered at the mill and was living there in the spring of 1849, was

The Old Mountaineer, Greenwood.

Who, with his Crow wife and numerous brood of half-breed children, occupied a capacious tent pitched in the lower part of the town, and which was made to serve the several purposes of domicile, dormitory, dog-kennel and kitchen. For this latter convenience the old fellow had not much use, the culinary operations of his household being of a simple and limited kind. Greenwood was himself a small eater; subsisted, in fact, mainly upon liquid food, his favorite beverage being whisky. By June the place had become altogether too civilized, as well as populous, to suit the old trapper's tastes, wherefore he pulled up stakes and removed to a little valley eight miles north, which still bears his name, and in which he died soon after. Greenwood, who was a native of Missouri, had from early youth spent his life hunting and trapping in the Rocky mountains and along the rivers that traverse the great western plains, and was in every respect, in his person, his habits and his morals, as good a representative of that brave and hardy, but often dissipated and reckless class, as ever trailed an Indian or trapped a beaver. The story of his life, could it be written, would form a narrative of no little interest. But as not much that is authentic in regard to his career has ever been preserved, he may be left to figure as the hero of some future romance or "Tale of the Border." Of his boys, bright and active lads, but restless as young eaglets, I have never been able to learn much. With their Indian blood, and lack of education, there was little likelihood of their betaking themselves to steady, hard work, and it is said that John, his oldest son, came to an unfortunate end many years ago. Boggs, his second boy, of whom I could relate some amusing stories illustrative of his smartness and cunning, would space allow, was the subject of a notice in a frontier paper not long since, and in which he is represented to have shot two gamblers, who bad, without provocation, assaulted him in a brutal manner. On the occasion alluded to this scion of the house of Greenwood exhibited, as might have been expected, the greatest coolness and courage, having fatally shot one of his assailants, and wounded the other, while he came out of the scrimmage himself but little hurt.

The Families Mentioned Above

Belonged to that restless class of American pioneers who, continuing to "go West" till they had reached the waters of the Pacific, had been carried this far back on the reflux tide. Crossing the plains a year or two before, these people had settled first in the lower valleys, and afterwards came up into the mountains to dig gold, bringing with them their wagons, families and a portion of their stock. Traveling with their traps, cooking by camp fires and sleeping in tents or covered wagons, was no hardship to them. Bennett was a carpenter, a short, compact built man, bristling with energy, and put up nearly all the better class of houses erected in Coloma that summer—among others Dye's hotel, for a long time the largest and best building in the place. Elihu Anthony was also an active, pushing sort of man, who, besides diligence shown in his secular affairs, when occasion required, acted also as an expounder of the scriptures and an exhorter to charity and good works. He was afterwards elected a member of the State Legislature, and to various other public positions, in all of which he discharged his duties in a manner acceptable to his constituency. Later in the summer, these families, with some others, tiring of the mines, returned to their homes at Santa Cruz, Sonora, and other towns

near the coast. The Packwoods also left, and, going as far south as the Tulare country, settled, and have since been living there, the owners of an extensive tract of fine land lying along Packwood's creek.

The Principal Trading Posts in the Place

Were carried on by General Sutter, Charles E. Pickett and Captain Shannon. Sutter occupied a double log-house standing on a little knoll half a mile south of the town, near the road leading in from the fort. Pickett's place, also a log-house, built palisade fashion, stood near the mill, Shannon's being a few rods distant. A party of Oregonians had pitched a huge tent in the center of the town, in which some provisions were sold and wheated drinking, gambling and carousing were going on day and night. Being in the hands of men not brought up to mercantile pursuits, this branch of business failed to be conducted with that closeness and system essential to success. During the flush times, while everybody had money and there was no opposition, these pioneer traders, with their easy going habits, got along well enough. But when times changed and keen competitors came in, store-keepers like Pickett and Sutter had to retire from the field, their books well filled with dubious credits.

Religious Services, Sunday Schools and Prayers.

While the rough element in California society was large from the first, there were among the primitive settlers here many devout and God-fearing people, as is evidenced by the fact that we had regular preaching and Sunday schools in Coloma even so early as the time of which I am speaking. The leading spirits in securing these religious observances were the Messrs. Bennett, Anthony and Dye, the latter two being zealous and intelligent expounders of the Word, while all of them, by their walk and conversation, illustrated practically the doctrines they taught.

One pleasant day, while divine service was in progress, there rode into camp a small party of splendidly mounted men, who, proceeding to the log hut that served for a meeting-house, jumped from their horses and hurriedly entered the place of worship. Among these newcomers was one, a short, stout-built man, with a ruddy, open countenance, who, as soon as a suitable opportunity offered, arose and unwittingly addressed the audience in a manner so entertaining and impressive that he soon gained their close attention. In the course of his remarks he disclosed the fact that he was a seafaring man and that, having just brought his vessel up the river to the embarcadero, he had come to gratify his curiosity by seeing the place where gold was first found; going on to admonish the people of the great future that was probably in reserve for the country and of the importance of gaining here for our political and religious institutions a firm foothold at the start. Having finished his remarks, the speaker knelt and offered up a fervent prayer, at the conclusion of which one of his companions also addressed a few words of kindly advice to the meeting. The first speaker was Captain Roland Gelston, who, after a successful passage round the "Horn," had brought his ship into the harbor of San Francisco, a few weeks before, and then sailed her up the river to the embarcadero, his having been the first square-rigged vessel that ever came up that far. Capt. Gelston, who was not only a Christian gentleman, but a splendid seaman, and in his death, which occurred at San Francisco some 10 or 12 years ago, our merchant marine lost one of its best sailors and brightest ornaments.

Much more of like purport might be related tending to show that the community was not all ungodly in these early times.

Of the Indian War

That for a while raged with virulence, and many other interesting reminiscences connected with the spring and summer of 1849, only brief mention can be made. This war, which culminated in the month of June, originated in a habit the Oregonians had of shooting the aborigines, according as they felt in a mood for this sort of sport, or a good opportunity offered. This naturally led to retaliation on the part of the Indians, who killed a number of the whites in the course of the spring, the victims always being Oregonians. Among others sacrificed to savage vengeance, was one of the Kelseys, of whom there were several brothers mining here at that time. At last six young men, all of them belonging to these implacable foes of the Indians, were killed at Murderer's Bar, over on the middle fork, an act that called for the immediate arrest and punishment of the guilty parties. A considerable force of whites, headed by John Greenwood and William Huefner, went after the Indians, killed some, and brought others into the mill, where ten of them were shot to death. Another party pursuing the savages over on the Cosumnes, killed some of them there, and thus put an end to their further butcheries.

Meantime the great immigration, the advance of which first reached here in March, continued to roll in; the batea and rocker began to give place to a multitude of new fangled machines; the tents and cabins were superseded by better buildings; the first stock of traders were crowded out, and the 48 miners were jostled in the diggings that they, in their simplicity, supposed would afford room for all. And thus before the summer was over the primitive town had become greatly changed, while the primitive inhabitant had disappeared in the multitude of strangers.

H. D.

Coloma, El Dorado Co., Nov. 12th, 1877.



## General News Items.

THE census of 1876 gives the population of France as 36,800,788.

THE military post on Big Horn river, Montana, is hereafter to be known as Fort Custer.

A PARTY of Mexicans pursued a band of marauding Indians into Texas recently, and punished them severely.

THE fire at the North Point Dock warehouse in this city on Monday, destroyed nearly \$500,000 of property.

A DISPATCH from Rio Janeiro states that the Argentine torpedo ship *Fulminate* exploded in the harbor of Buenos Ayres, killing 11 persons.

GERMANY and Italy have paid the balance of their subsidies to the St. Gothard tunnel—respectively, 4,000,000 and 2,700,000 francs.

ON account of the non-payment of their wages, the miners of the Keets mine, at Deadwood, Dakota, have taken forcible possession of the mine.

THE resignation of Gen. LaGrange, Superintendent of the San Francisco Mint, was received at Washington, Saturday. The President accepts it, to take effect December 31st.

LEONARD, of Louisiana, has introduced a bill fixing the salaries of Judges of the District Courts of California and other districts at \$5,500, and reducing the salaries of several District Judges to \$4,500.

THE Secretary of War has issued an order that all names of battlefields in the army register, which heretofore have been at the head of regiments, should be kept out of the record until further orders. This is in accordance with a conciliatory policy, and in keeping with Sumner's plan to erase the names of battlefields from flags.

EVERY well now being bored in Ventura county shows oil, but the operators have orders to pay no attention to a small supply, but push downward. The intention is to ascertain whether a grand reservoir exists below, as in Pennsylvania. Some leases have been made on condition that the operators shall sink to a depth of 1,500 feet, unless a certain quantity of oil is sooner encountered.

ARIZONA [TRADE.—A dispatch from Camp Grant, Arizona, dated the 12th, inst. says: The diversion of trade which was expected Eastward is now assuming a serious aspect. Directions have been received from Washington to draw all supplies for the Department of Arizona from the East, on account of cheaper prices and transportation, and mercantile firms will follow in the wake of the action of the military. Nearly all the post traders, and several firms in Tucson, are preparing to deal with the East, via the Fort Carland, El Moro and Mogollon road. This will be a heavy loss to San Francisco shippers, which can hardly be repaired, save by a reduction of prices in goods and rates of transportation by the Southern Pacific railroad. Goods can be laid down here by Eastern routes from 24 to 25 cents cheaper, with more accommodation and promptness.

STAGES TO TUSCARORA AND CORNUCOPIA.—Our agent, who has lately passed over the stage lines on this route, gives the following for the benefit of other wayfarers: "C. C. Haynes' stage line from Battle Mountain to Tuscarora leaves immediately upon the arrival of the Eastward and Westward bound trains. About 12 hours' time is saved in going to Tuscarora, and about 24 hours saved in going from Tuscarora to San Francisco by this route. W. S. Van Dreiler's stage line from Elko to Tuscarora and Cornucopia, leaves Elko every morning at six o'clock; time to Tuscarora, eight hours. Leaves Tuscarora about 6 A. M.; time to Elko, nine hours. No loss of sleep and less hours of staging by this route.

THE NATIONAL DRILL.—A correspondent signing himself "Engineer," writes us that the National drill and air compressor is doing splendid work in the Gover mine, Amador county. "It has accomplished double the amount of work done by hand and at no more cost, thus saving 50% in sinking the shaft. In running levels, etc., it will do better than this, as it does not break down."

A LETTER from a prominent broker, who is on a tour of observation through the Black Hills, says that A. W. Whitney, a former heavy operator on California street, is in receipt of \$5,000 daily for crushing ores in that country. He did not do so well down in Banner district, San Diego county, where he is pretty well known.

THE Washington *Republican* says that telephones have been placed on the lines between the White House and the Treasury, the Navy Department and Navy Yard, the Signal Office and Fort Whipple, and various other places in that city.

JOSHUA HENDY has just shipped five of his concentrators and two \$81,000 Challenge ore feeders" to the new 10-stamp mill of the Potosi mine, Amador county. The mill will probably be running next month.

BULLION.—The clean-up of the Consolidated Virginia mine, for October, was \$1,292,420.20; that of the California was \$1,674,856.79; total or the bonanzas for October, \$2,967,276.99.

THE Ophir election occurs on the 21st of December and a contest is already hinted at.

## PATENTS AND INVENTIONS.

## List of U. S. Patents Issued to Pacific Coast Inventors.

(FROM OFFICIAL REPORTS FOR THE MINING AND SCIENTIFIC PRESS, DEWEY & CO., PROPRIETORS AND U. S. AND FOREIGN PATENT AGENTS.)

By Special Dispatch from Washington, D. C.

WEEK ENDING OCTOBER 30TH, 1874.

DISSEMINATING CLUTCH COUPLING FOR SHAPING.—Napoleon Beauregard, S. F.

EXCAVATING MACHINE.—John S. Hall, S. F.

Cal. and Emory W. Chapman, S. F.

SKREW PULLER.—Fredk A. Will and Julius Fluck, S. F.

NAPKIN HOLDER.—August Barlow, S. F.

CAR COUPLING.—Lewis T. Beaver, Placerville, Cal.

SEWER TRAP.—Wm. H. Gullie and Edward Deady, S. F.

SHOE FASTENER.—John S. Hall, S. F.

OVERALLS.—David Neustadter, S. F.

MACHINE FOR DRILLING OIL WELLS.—Jacob Strongel, Andrews Station, Cal.

REISSUES.

GANG PLOW.—Wm. Fruhling, San Jose, Cal.

TRADE-MARKS.

KEROSENE OIL.—A. C. Dietz & Co., S. F.

The patents are not ready for delivery by the Patent Office until some 14 days after the date of issue.

NOTE.—Copies of U. S. and Foreign Patents furnished by DEWEY & CO., in the shortest time possible (by telegraph or otherwise) at the lowest rates. All patent business for Pacific coast inventors transacted with perfect security and in the shortest possible time.

## METALS.

[WHOLESALE.]

THURSDAY, M., November 15, 1877.

IRON.—		
American Pig, ton.	23 00	@ 32 00
Scottish Pig, ton.	32 00	@ 33 00
White Pig, ton.	23 00	@ —
Oregon Pig, ton.	—	@ —
Refined Bar.	3 50	@ 63
Horse Shoes, keg.	5 00	@ 72
Nail Rod.	—	@ 72
Norway, Oval.	—	@ 71
Roller.	—	@ —
COPPER.—		
Copper Tinned.	37	@ 40
Sheathing, lb.	37	@ 40
Sheathing, Yellow.	21	@ 22 1/2
Sheathing, Old Yellow.	10	@ 11
Composition Nails.	21	@ —
Composition Bolts.	24	@ —

STEEL.—		
English Cast, lb.	14	@ 25
Anderson & Woods, many sizes.	15	@ 24
Drill.	15	@ —
Flat Bar.	15	@ 18
Plow Steel.	8 1/2	@ 12 1/2
TRIP PLATES.		
10x14 ft. Charcoal.	8 50	@ 9 00
Banca Tin.	24	@ —
Australian.	19	@ 20
ZINC.		
By the Cask.	11	@ —
Zinc Sheet 7x3 ft. 7 to 10, lb.	11	@ —
7x3 ft. 11 to 14.	11	@ —
8x4 ft. 8 to 10.	12	@ —
8x4 ft. 11 to 10.	12	@ —
Assorted sizes.	3 00	@ 25
QUICKSILVER.		
By the lb.	47 1/2	@ 50

## LEATHER.

[WHOLESALE.]

WEDNESDAY M., November 14, 1877.

Sole Leather, heavy, lb.	26	@ 25
Light, lb.	22	@ 24
Jodot, 8 Kil, doz.	48	@ 50 00
11 to 13 Kil.	55	@ 56 00
14 to 16 Kil.	60	@ 60 00
Best Choice, 11 to 16 Kil.	55	@ 60 00
Cornellian, 12 to 16 Kil.	57	@ 60 00
Females, 12 to 13 Kil.	63	@ 67 00
14 to 16 Kil.	71	@ 76 50
Simon Ulmo, Females, 12 to 13 Kil.	58	@ 62 00
14 to 16 Kil.	66	@ 70 00
16 to 17 Kil.	72	@ 74 00
Simon, 13 Kil.	61	@ 63 00
20 Kil.	65	@ 67 00
24 Kil.	72	@ 74 00
Robert Calif. 8 Kil.	35	@ 40 00
Kips, French, lb.	1 00	@ 1 35
Cal. doz.	40	@ 60 00
French Sheep, all colors.	8	@ 15 00
Eastern Calf for Backs, lb.	1 00	@ 1 25
Sheep Roams for Topping, all colors, doz.	9 00	@ 13 00
For Linings.	5 50	@ 10 50
Cal. Russet Sheep Linings.	1 75	@ 4 50
Boot Legs, French Calf, pair.	4 00	@ 4 75
Good French Calf.	4 00	@ 4 75
Best Jodot Calif.	5 00	@ 5 25
Leather, Harness, lb.	35	@ 38
Light, lb.	48	@ 50
Skirting, lb.	33	@ 37
Welt, doz.	30	@ 60 00
Buff, ft.	18	@ 20
Wax Side.	17	@ 18

## Gold, Legal Tenders, Exchange, Etc.

[Corrected Weekly by SUTRO & Co.]

SAN FRANCISCO, November 14, 3 P. M.

LEGAL TENDERS in S. F., 11 A. M., 97 1/2 @ 98. SILVER, 4 @ 41

Gold in New York, 102 1/2.

Gold Bars, \$50 @ 510. SILVER BARS, 6 @ 14 @ cent. discount.

EXCHANGE on New York, 1 1/2; on London bankers, 49 1/2;

Commercial, 50; Paris, five francs \$1 dollar; Mexican dollars, 95.

LONDON Consols, 95 3/16; Bonds, 106 1/2.

QUICKSILVER in S. F., by the flask, @ 1 lb. 46 @ 47 1/2.

## Signal Service Meteorological Report.

Week Ending November 13, 1877.

HIGHEST AND LOWEST BAROMETER.

Nov. 7 Nov. 8 Nov. 9 Nov. 10 Nov. 11 Nov. 12 Nov. 13

30.30 30.25 30.09 29.81 29.80 30.15 30.25

30.22 30.15 29.95 29.83 29.81 29.00 30.17

MINIMUM AND MAXIMUM THERMOMETER.

65 67 67 62 60 60 55

52 53 57 50 55 51 40

MEAN DAILY HUMIDITY.

79 70 72 70 83 66 76

PREVAILING WIND.

N | NW | NW | SE | W | NW | W

WIND—MILES TRAVELED.

135 | 107 | 121 | 136 | 205 | 149 | 118

STATE OF WEATHER.

Fair. | Fair. | Fair. | Cloudy. | Rainy. | Clear. | Fair.

RAINFALL IN TWENTY-FOUR HOURS.

Total rain during the season, from July 1, 1877, 1.84 in.

## Mining and Other Companies.

Persons interested in incorporated shares will do well to recommend the publication of the official notices of their companies in this paper, as the cheapest appropriate medium for the same.

## California and Oregon Land Company.

Location of principal place of business, San Francisco, California. Location of works, Jackson County, Oregon.

Notice is hereby given, that at a meeting of the Board of Directors, held on the seventeenth day of October, 1877, an assessment, No. 1, of thirty-five cents per share was levied on the capital stock of the corporation, payable immediately in U. S. gold coin, to the Secretary, at the office of the company, 418 California Street, San Francisco, California.

Any stock upon which this assessment shall remain unpaid on the twenty-eighth day of November, 1877, will be delinquent, and advertised for sale at public auction, and unless payment is made before will be sold on Monday, the twenty-fourth day of December, 1877, to pay the delinquent assessment, together with costs of advertising and expenses of sale. By order of the Board of Directors.

J. W. CLARK, Secretary.

Office, 418 California Street, San Francisco, California.

## Excelsior Silver Mining Company.—Prin-

cipal place of business, San Francisco, Cal. Location of works, Pototsi District, Lincoln County, Nevada.

Notice is hereby given that at a meeting of the Board of Directors, held on the second day of November, 1877, an assessment of ten cents per share was levied upon the capital stock of the corporation, payable immediately in U. S. gold and silver coin, to the Secretary, at the office of the company, 312 Post Street.

Any stock upon which this assessment shall remain unpaid on the third day of December, 1877, will be delinquent, and advertised for sale at public auction, and unless payment is made before, will be sold on Monday, the seventeenth day of December, 1877, to pay the delinquent assessment, together with costs of advertising and expenses of sale.

W. K. MEYER, Sec'y.

Office, 312 Post Street, San Francisco, Cal.

## Mariposa Land &amp; Mining Company of

California.—Location of principal place of business, San Francisco, California. Location of works, Mariposa County, Cal.

Notice.—There is delinquent upon the following described stock, on account of assessment (No. 12) levied on the 12th day of September, 1877, the several amounts set opposite the names of the respective shareholders, as follows:

COMMON STOCK.

Name. No. Certificate. No. Shares. Amount.

Ambleman, Edgar M. 1490 100 100 00

Ambleman, Edgar M. 1491 100 100 00

Ambleman, Edgar M. 1492 100 100 00

Ambleman, Edgar M. 1493 100 100 00

Ambleman, Edgar M. 1494 100 100 00

Ambleman, Edgar M. 1495 100 100 00

Ambleman, Edgar M. 1496 100 100 00

Ambleman, Edgar M. 1497 100 100 00

Ambleman, Edgar M. 1498 100 100 00

Ambleman, Edgar M. 1499 100 100 00

Ambleman, Edgar M. 1500 100 100 00

Ambleman, Edgar M. 1501 100 100 00

Ambleman, Edgar M. 1502 100 100 00

Ambleman, Edgar M. 1503 100 100 00

Ambleman, Edgar M. 1504 100 100 00

Ambleman, Edgar M. 1505 100 100 00

Ambleman, Edgar M. 1506 100 100 00

Ambleman, Edgar M. 1507 100 100 00

Ambleman, Edgar M. 1508 100 100 00

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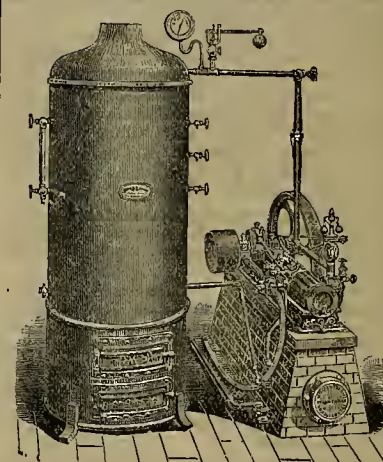
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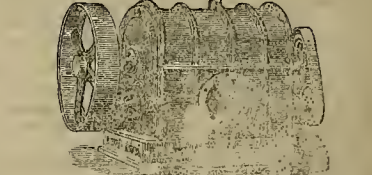
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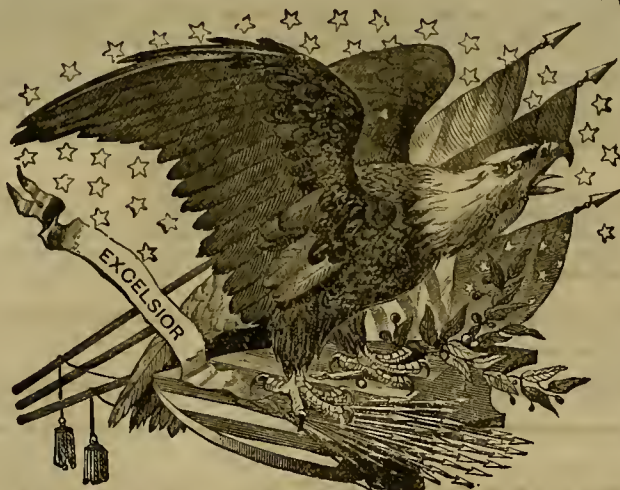
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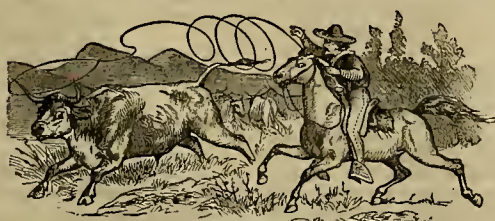
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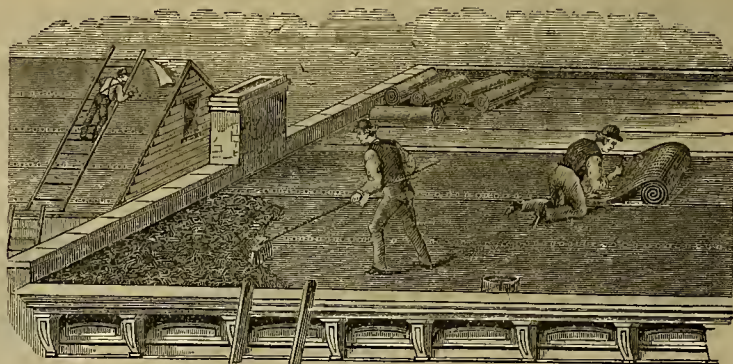
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## "More than Pleased."

OSCEOLA MINE, NEVADA Co., CAL., April 19th, 1877. MESSRS. DEWEY & Co.—Gentlemen:—We are more than pleased with your professional ability in the management of our application, and will always recommend your competency as Patent Attorneys, and your honorable and gentlemanly dealings with clients. Truly and respectfully yours, LOUIS R. TULLOCH. THOMAS D. TULLOCH.



# MINING AND SCIENTIFIC PRESS.

An Illustrated Journal of Mining, Popular Science and General News.

BY DEWEY & CO.,  
Patent Solicitors.

SAN FRANCISCO, SATURDAY, NOVEMBER 24, 1877.

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## Thanksgiving.

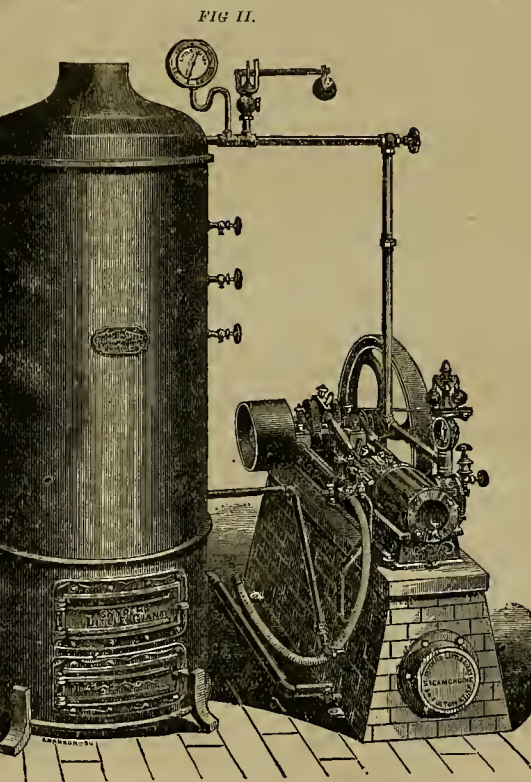
Again the yearly installment of New England's legacy to this country falls due; again, by recommendation of President and Governor, there will be formal rendering of thanks in all the churches and cessation from accustomed avocation in all the busy marts and manufactories; again, devout hearts will fill with thanks to God for his loving kindness and tender mercies. It will be this year, as aforetime, a day of feasting and of praise; an occasion for family reunions in which silver locks will join hands with golden curls over the lapse of, perhaps, half a century, with eyes looking backward and forward along the course of time.

Thanksgiving day has often been distinguished as the home holiday, and truly, too, for such indeed it is. It is a priceless boon to American homes, for the impulse in this stirring quarter of the world lies rather in tangents to the home circle than in the quiet revolutions amid homo influences which quieter nations know. The making of new homes has been the chief occupation of the American people for a century and will be for many years to come. How precious, then, is an institution which calls many in person and all in thought, to the old home where early lives were moulded into such strength of manhood and womanhood that the founding of new homes became possible. We are too apt to forget the old homes and the priceless training they bestowed. We too often pursue our courses with the idea that the vigor and enterprise, which mark our progress, are proud qualities which we have ourselves discovered and developed. Such vain thoughts are untrue and unwise. It is true that conditions have evoked vigorous thought and action among those who have transformed the western wastes into the western world but the conditions would have been powerless had not those who enjoy them brought to the conquest qualities fitted for victory. We owe our advancement to the inheritance of the spirit, precept and example of the old freedom makers of the Atlantic coast. Nor did they altogether originate the quality of devotion to principle and energy in industrial achievement. Its sources lie far back among the centuries and its springs may be found here and there across the continent of Europe, from the rugged Highlands and the frozen fords to the resolute Netherlands and the majestic Rhine, to sunny France and even to the genial Mediterranean shores. It matters not whether these gifts of genius, of labor and of truth came to us through the generations which have come and gone upon our eastern shore, or whether they have come fresh from noble homes abroad, they are all now in truth American and entitled to enjoy with us the home-recalling features of our Thanksgiving Day. Thus perhaps our thanksgiving may be more catholic than that which prevails within New England's boundaries; and we believe that as it extends its scope and view it becomes more beautiful and truly American. Thus it drops altogether its sectional character. As it leads us all to return in thought and thanks to the homes from which we came, it awakens a feeling of grateful remembrance to all the nations which have joined to give the world America; the pride and hope of all who love liberty throughout the earth. With this thought, let every California home, no matter whence its founders came, make merry and give thanks on this, the American Thanksgiving Day.

It is one of the privileges of observers of the National Thanksgiving to give thanks to the Divine ruler for the material benefits which He has bestowed during the year which is closing. There are two ways by which to measure prosperity; one direct, by the good things in actual possession; another indirect, by the thought of

evils from which, happily, Providence has spared us. Both these methods will rightly enter into the mind of the Californian this year, and both will fill the heart with thanksgiving. To many of our readers the year has been one of good return for labor; to others there has been little given save life and a measure of comfort. To those whom good harvests and increased price for produce have blessed, there is an easy task to give thanks. To those, who have looked out upon arid fields or have found no market for their labor, there still remains hope for the future and thanks that their lives and strength have been preserved for it. We are reminded that the year has been hard in California, that crops have been of lessened amount and that the laborer has been without his hire. We deplore it and lack no appreciation of the deprivation and self-denial which have been undergone by brave hearts. But have we no thanks to render to God who has given us enough to maintain life and courage while thousands in India have been crushed beneath the heel of relent-

less famine? It is true also, that never in our history as a State, have we experienced such a lack of employment for labor and all its attendant evils. It is true that our laboring men have been urged by their want upon the verge of disturbance, and the impulses of misguided humanity have arisen in their minds. But does not the present peace and quiet call for thanksgiving when we think of the 70,000 Russians who have thus far fallen, and of the thousands of Turkish homes which have been pillaged and laid waste? Indeed, when one looks aright upon the measure of discomfort and reflect that no small part of it is owing directly to our unwise action and untrue policies, there seems no cause to restrain full-hearted thanksgivings for manifold blessings, but rather to rejoice and resolve that the lessons of the year shall not go unheeded by.



SNYDER'S IMPROVED "LITTLE GIANT" ENGINE AND BOILER.

As is our happy privilege, we extend to all homes to which our words shall come, our sincerest good wishes for the joy of their Thanksgiving merry makings and reunions. Nor would we forget to remind them all, that the quality of giving, like mercy, is twice blessed, and if they would enjoy their own plenty to the utmost, they must not forget those homes

which look, and into which they can bring light and comfort by their thoughtful bounties. Let all see to it, that no home within their knowledge fails of material to make November 29th indeed a Thanksgiving Day.

## The Little Giant Engine and Boiler.

We illustrate herewith one of the improved "Little Giant" horizontal engines and vertical boilers, manufactured by Snyder Bros., 94 Fulton street, New York. This engine is of the new design and has many radical improvements over the old one of the same name. Fig. 1 shows the boiler and engine with the necessary pipe connections, etc., and Fig. 2 is a vertical section of the boiler.

In the boiler all the joints are screwed together, while the large central tube B, as well as the smaller side tubes 6, 6, are lap-welded. The strength of ordinary riveted joints are esti-

mated at 44% less than the boiler plate, but lap-welding makes the shell virtually a continuous piece of metal of uniform strength. The stay rod, 2, as well as the side tubes, 6, 6, are connected to the main shell of the boiler B by means of an ingenious device known as a "double tapered bushing." This system of construction avoids all the weakening caused by riveted seams, and avoids the injuries so common to caulking.

Among the improvements in the boiler is the substitution of the smoke-bonnet, A, for the elbow at the side, formerly used for conducting the smoke to the chimney or stack. This arrangement allows the heat and gases to circulate uniformly among the small tubes which constitute a large part of the evaporating surface and materially improves the natural draft. The Little Giant boiler, as originally made, was open to the objection common to all of the external fire-box type, viz., that as the furnace is not surrounded by water space, a considerable amount of heat is lost by radiation. To obviate this difficulty, second or inner casing, S S, is introduced, which extends from the top downwards and behind the fire-brick furnace lining, 15 15, to a point below the grate. The

outer or main casing is perforated with a row of holes near the top, which may be opened or closed at will by means of a band similarly perforated. When both the furnace and ash-pan doors are closed and the damper band is in such a position as to uncover the holes, the air enters and passing downward, as indicated by the arrows, absorbs the heat radiated through the inner casing and returns it to the fire. With the damper band closed and the usual draft through the ash-pan door, the boiler is as effective as an ordinary stove for heating the room.

Of the important changes made in the engine we notice the substitution of a circular slide valve, with an auxiliary steam port, for the ordinary rectangular or D valve; the steam and exhaust ports on the face of the cylinder being also curved in such a manner as to correspond suitably with the form of the valve. It is held in proper position by a circular yoke attached to the valve stem in which it is perfectly free to revolve. A novel as well as important feature in its action is that the area of port opening increases in proportion to the increased speed of the piston from the commencement of the stroke, thus maintaining uniform pressure in the cylinder until the point of cut off is reached.

The use of an elemental governor in place of the ordinary ball governor secures a more uniform speed than is possible with the latter kind unless under varying loads. A feed water heater under the engine, through which the exhaust steam is conducted in small pipes, heats the feed water up to the boiling point before reaching the boiler. The heater is so constructed and placed in such a position that it does not increase the space occupied by the engine. The steam and water spaces are easily opened for inspection or cleaning without disturbing any pipe connections. Messrs. Snyder Bros. also manufacture a variety of engines adapted to different uses, among which are single and coupled engines with cranks at right angles, with or without link motion and reversing levers, suitable for yachts, hoisting purposes, etc.

THE PARIS EXPOSITION.—The House of Representatives yesterday (Tuesday) passed a bill appropriating \$150,000 to defray the expense of representing the United States at the coming French Exposition. The bill provides for the appointment of a Commissioner-General and 20 additional Commissioners; provided that no two of said Commissioners shall be appointed from one State. Three of said Commissioners shall be practical artisans, three shall be skilled representatives of commerce and manufactures, four shall be practical agriculturists, and nine shall be scientific experts. The 20 additional Commissioners will be assigned to report upon the nine groups into which the Exposition will, under official regulations, be divided, the Commissioner-General to report upon the exhibition at large and the general results thereof. The allowance to said Commissioner-General for salary and personal expenses shall not exceed \$5,000 for his term of office, and the allowance of the 20 additional Commissioners for salary and personal expenses shall not exceed \$1,000 each. The President may appoint two Honorary Commissioners from each of the several States, and the President may appoint 24 additional Honorary Commissioners, among whom there shall be at least one resident of each of the Territories, which said Honorary Commissioners may report on special subjects, but shall not be entitled to either pay or compensation out of the money appropriated. The money appropriated shall be expended under the direction of the Secretary of State, and the Commissioner of Agriculture shall collect and prepare suitable specimens of the agricultural products of the several States and Territories for the exhibition.

KARS has been captured by the Russians.



## CORRESPONDENCE.

It is the desire of the editors of this journal to be liberal toward all correspondents, and therefore statements and opinions are frequently published, on the authority of the writers, for which we do not assume responsibility.

### Trees and Rainfall.

No. 1.

[Written for the Press by SAMUEL PURNELL.]

#### The Approach of the Desert—The Crime Against Posterity.

It has been the fortune of but few people in any age of the world to understand the forces of nature, and to wield them for beneficent purposes. The talents of mankind have been mainly applied to the art of desolation, and to impeding nature in her efforts to bestow upon her children the blessing of trees and rain. Man modifies, if not determines, the material structure of his earthly home, and his influence upon the condition of the country he inhabits, has been much greater than any of the recent geological changes. In more barbarous times than the present, man sympathized with the beneficent operations of nature, because he lived closer to her; his home was in the forest, he reposed in its shade, subsisted by its fruits, and made the trees his shelter and his defense. He was the offspring of the forest, and he tenderly cared for his progenitor. Primeval man, in want of a fire, did not fell a tree, but contented himself with fallen wood; in want of a hut, did not destroy an acre of timber in search for the choicest lumber, but was satisfied with a few rough slabs; he did not set fire to the neighboring forest for the gross pleasure of destroying, for he knew that same forest was his nourisher and preserver, furnishing him food, shelter and clothing. Abundant rains watered the primeval forests—which almost universally covered the earth—the trees and shrubs and grass grew vigorously, there were neither extremes of heat nor cold, floods nor drouths. Here man was evolved and developed, and started upon his career of progress. As he increased in numbers and his wants augmented, he partially outgrew these primitive conditions; he needed soil to cultivate, in order to raise more nutritious fruits and grains than were spontaneously produced; he needed land to build his towns upon, he required wood to build his houses and ships, and to accomplish this it was necessary for him to fell a portion of the forest. Entering upon wars, the forests were often destroyed to provide war material and shelter, or to prevent them from supplying the same to enemies. As the numbers of people increased, more and more the trees were felled, more and more the primitive forests disappeared, more and more the land was stripped of its covering, till gradually and irresistibly the quality of the seasons changed, and changed for the worse.

As among our earliest historical records appear those of

#### Western Asia,

The consequences of this war on nature there will first be noticed: In the course of a few centuries from the date of the earliest annals, indications were perceived of a want of summer rains. That country had been among the most favored and fertile portions of the earth; there was located the fabled Garden of Eden. At length the rains refused to fall during their accustomed seasons; they fell in floods at long intervals, and during those intervals scorching heat and dreadful drouths supervened. In a short time the crops became uncertain, the summer rains ceased, and the inhabitants were forced to resort to irrigation in those places where the floods of winter could be stored up against times of drouth in the valleys. The high lands were by this time abandoned by husbandmen. The rivers began to fail in summer, and bore little water, except that resulting from occasional destructive torrents. Irrigation answered for a time, but, as the few remaining forests were sacrificed to the folly of the people it was seen that the annual rainfall diminished; the mountain springs became dry, the irrigating reservoirs and canals contained no water, and no crops of fruit or grains could be produced from the hard and withered soil. The ultimate result of man's warfare on nature approached, the hot blast of the desert swept over the ruined land, covered it with sand, and most of the wretched inhabitants who remained emigrated or perished.

Such is the sylvatic history of Persia, Arabia, Armenia, Asia Minor, Northern Africa, portions of Greece and Rome, and of most of the lands that border the Persian Gulf, the Red and Mediterranean seas. The ancient countries of Western Asia are now but scenes of desolation. The countries that sent forth the conquering armies of Darius, Xerxes and Cambyses have been for many centuries covered with sand, parched with sun and drouth, and their miserable inhabitants reduced to small numbers, alike objects of pity and contempt. No considerable number of people now dwell or could now subsist upon the northern shore of Africa, were once Carthage, the great city of a great State, held sway over a large population of tillers of

the soil. The song of the German poet is realized:

"Africa's barren sand,  
Where naught can grow, because it raineth not,  
And where no rain can fall to bless the land,  
Because naught grows there."

More than half of the country embraced in the Roman empire is

#### Now an Uninhabitable Desert,

And surrendered to hopeless desolation, and the teeming multitudes who lived there in plenty have disappeared, leaving no posterity. The forests have been destroyed, the soil has been washed away by floods, springs and streams are gone, and the earth is covered with sand. Of the former productiveness of the soil we can now discover but few traces. A country as large as the whole Christian world of to-day, has become devastated and unfit for human habitation. Such has been the consequence of man's disregard of nature's laws in the preservation of the forests, often the result of war and social and ecclesiastical tyranny and misrule.

#### Results of the Ravages of Man.

It is melancholy to reflect upon this ruin, and to know that these results were and are directly and solely caused by the ravages of man. Man, in his state of ignorance and supreme selfishness, has, during the historical epoch, acted as though the trees, planted by nature to increase and protect the soil and to produce rain, are his enemies or obstacles to his advancement, and has turned his energies to their destruction. Wherever man has planted his foot, the harmonies of nature have been turned to discords, and he has been a destructive power. Unfortunately, indeed, for himself and for his posterity, the living trees and grasses have been the most convenient to his wasting hands, and upon them he has wreaked his malice and selfishness. But he brought upon himself his own punishment, for the vengeance of outraged nature overtook him and punished him and his descendants with the curse of drouth, sand and destruction.

### Wilhelm's Dry Placer Amalgamator.

EDITORS PRESS:—In your issue of October 20th I read an account of some dry placer machines, and I judge from it that considerable interest is manifested in California on this subject. It might be important for some of your readers to know that a third machine has been invented, and I proceed to give some facts concerning it. This machine is "Wilhelm's Dry Placer Gold Separator," on which Mr. J. H. Wilhelm, of this city, has been at work for nearly two years. A new test machine with improvements was recently constructed, and was operated about a week ago on a mine three miles up the Platte from this city. It was found to be successful, even beyond the inventor's expectations, the dirt being washed thoroughly and every visible particle of gold being saved. The machine consists of a cylinder constructed in such a manner that the front part of it is a washing basin. The lifters or dashers in this basin tumble the dirt so as to loosen and disintegrate it. It is then thrown along by the revolutions of the cylinder on to a screen, which allows the gold and fine material to pass through into small sluice boxes, while the boulders and coarser stuff are thrown out below. Thus there are two kinds of tailings, coarse and fine, the fine being composed largely of black sand. The water is supplied through a perforated pipe which forms the axle of the cylinder. A provision is made in the machine for catching nuggets, if there be any in the mine, so that every contingency is provided for. The capacity of the machine depends only on its size, and its size is regulated by the supply of water. It is proposed now to construct four sizes: The half-inch machine, using half an inch of water, the inch machine, one inch of water, the one-and-a-half-inch machine, and the three-inch machine—the latter to run either by horse or steam power. Its cylinder will be four feet in diameter by eight feet long. It will be fed by elevators, and its capacity will be very great. The machine recently experimented with was the one and one-half inch *hand machine*. It uses from one to one and one-half inches of water, and under slight pressure weighs, without the tank, not more than 200 pounds, if as much. The price of this size is \$200, complete without the tank. It requires two men to work it, one to feed and the other to turn the crank. When pumping into the tank was difficult, and no power was used, it might need a boy or another man. The machine will dress what two men would shovel into it, but where two men feed the turning is heavy, and a jack, mule or weight power would have to be attached. The gold is caught in three 12-foot lengths of narrow sluice boxes with a *bored* rifle, and the cleaning up is the same as in sluicing, only the amount of black sand and fine gravel mixed with the gold is very small.

The machine tested used only two lengths of sluice, and in cleaning up there was but a fair panful of dirt. No mercury is used about the machine. Of course the amount of gold saved depends entirely upon the richness of the ground—the richer, the more gold, as in every thing else. Some of the gold secured by this machine was so fine as to be barely perceptible. The very finest is saved, for there is no strong current of water to carry it off. The work of removing the coarse gravel and boulders is done by the machine itself. The half inch machine

will be very light, and is designed as a sort of prospecting machine, or to work where ground is very rich, and water perhaps entirely absent. The water used by any of the machines can be settled in a reservoir and pumped back into the supply tank. In many places where there is rich ground, and only a minute stream of water two large tanks can be constructed. Into the upper one the stream or spring can be turned during the night, and the lower one will catch all the waste during the day. Therefore only a small per centum of the precious fluid need be wasted. Miners generally have horses and mules, and they can always be utilized during the daytime for power, a small horse-power being light, and costing little. The cylinder is required to make only about 20 revolutions to the minute, so that, with proper gearing, a pair of mules might run several half-inch machines, and do all the pumping besides, thus leaving the operators to feed the machines to their utmost capacity.

Wilhelm's machine is patented, but no company has been formed yet, though the parties interested are prepared to build some machines. It is expected that by next spring the company will be fully organized. They propose now, instead of manufacturing for the whole gold producing region, to sell rights, and to retain only so much as can be readily attended to. Very truly yours,  
F. S. DELLENBAUGH.  
Denver, Colorado, Nov. 10th.

### Calaveras County Mines.

EDITORS PRESS:—The San Bruno Con. G. M. Co., at a recent cleaning up of about 300 tons of ore from the San Bruno, it exceeded the most sanguine expectation of the Superintendent; the rock was unassorted, and a great deal of vein matter and dyke was mixed up with the ore. Notwithstanding all this it paid upwards of \$25 per ton. John L. Hoey, Esq., is Superintendent. They have now commenced to sink, and after sinking 100 feet will drift east and west.

#### The Banner Mine,

Col. J. W. Johnson, Superintendent, having freed the mine of water and put in new 8-inch Cornish pumps, has begun to sink on the main shaft and is working also in the drifts. The first piece of rock taken from the mine, under the present administration, showed free gold.

#### The Holmes Mine

Has a tunnel in about 350 feet; vein from three to five feet in thickness, which prospects finely. On the property is a 10-stamp mill, which is now being got in readiness for a crushing from the mine. It is expected that the mine will furnish ore in sufficient quantities to keep the mill constantly running.

#### Blue Jay and Greenhorn Con. Co.

This consolidation is still running and still continues to yield as rich rock as ever. Work continues in main shaft and drifts, and a force of men are now engaged in building a whim. The last crushing from this mine at the San Bruno mill yielded over \$100 per ton. Several hundred pounds of specimen rock has been sold to manufacturing jewelers at \$16 per ounce, rock and all. The Blue Jay is the property of Rodgers, Potter & Spaulding.

#### The Sledge Hammer

Is owned by Lee Sampson, Esq. Work has been resumed on this mine with flattening prospects.

#### The Valentine Mine.

A large force of men were put to work on this mine last week, and the company are now building a large 20-stamp mill for custom purposes, and also one at the mine for the use of the mine.

There are several other mines that will start up during the month, and Mosquito is at the present time as lively a camp as any in the State.

Several new houses are in course of construction. The Banner hotel will put on an extension of 20 feet. Harrison Longley has opened his hotel and placed Mrs. F. Peck in charge. The Hotel de Woodcock has thrown open its doors. A miners' outfitting establishment will also shortly be started. Mosquito now contains five hotels, viz.: Banner, Briggs, Longley, Woodcock and Gross Mamma, two saloons and a blacksmith shop. "ONALED."  
Mosquito Gulch, Calaveras Co., Nov. 15th.

EXPENDITURES ON CLAIMS.—The General Land Office has rendered a decision of importance concerning Section 2,324 of the Revised Statutes, which requires a certain annual expenditure on all mining claims. Commissioner Williamson holds that the first annual expenditure upon a claim located prior to May 10th, 1872, should have been made by the first day of January, 1875, and the second by January first, 1876; also, that the first annual expenditure upon a claim located since May 10th, 1872, should have been made or must be made within one year from date of discovery and location, and that the amount required by the local mining laws or regulations to be expended before a record of such claims can be made may apply upon the first annual expenditure on claims thus held, if the other provisions of law are complied with. The second year commences immediately on the expiration of the first, and the required expenditures may be made at any time during the year.

### A New Ore Feeder.

Chas. C. Stevenson, of Gold Hill, Nev., has patented through the MINING AND SCIENTIFIC PRESS Patent Agency, an improved ore feeder. The hopper is made in the usual way. The shoe or tray is made considerably wider than the lower open end of the hopper, and it is permanently secured below the hopper at a slight inclination, so that the ore which passes through the lower end of the hopper will be received upon it near one corner. The shoe extends to a sufficient distance in front of the hopper to deliver the ore which drops from its extremity into the battery and this extremity has a little more pitch than the main length of the tray. The tray is immovably fixed below the hopper so that it receives the ore from the hopper on one corner. In order to move the ore forward from underneath the hopper and feed it over the front edge of the tray a horizontal rotary hnh, provided with a number of radiating arms is employed. This hnh is mounted on the upper end of an upright shaft, which steps on a bearing below the tray while its upper end passes through the bottom of the tray near its center. As the tray is slightly inclined this shaft will also be correspondingly inclined. The hnh and arms lie close to the bottom of the tray and the arms extend out as far as it is possible for them to move around in a circle in the bottom of the tray, when the shaft is rotated.

The upright shaft is rotated by power derived from the drop of the stamp in the usual way of operating automatic ore feeders, so that each time the stamp drops it causes the hub and its arms to rotate slightly, and thus carry forward and drop a quantity of ore into the battery.

The arrangement for rotating the shaft by the drop of the stamp consists of a lever which is pivoted to the frame so that its short end extends out alongside of the stamp stem in condition to receive the stroke of the tappet and he depressed when the stamp drops. The opposite extremity of this lever is inverted by a pitman with friction clutch. This clutch engages with a wheel which is secured upon a horizontal shaft, so that each time the lever is depressed by the drop of the stamp the shaft is partially rotated. This shaft extends horizontally beneath the tray, one end being supported in a suitable bearing which is attached to the corner timber of the feeder frame, while its opposite end is supported by the hollow standard which surrounds the upright shaft. A bevel wheel on this shaft engages with a bevel wheel on the upright shaft, thus transmitting the rotary motion to the upright shaft and its arms.

The inventor has also devised a very simple and convenient device for adjusting the stroke of the lever for regulating the feed. The arms of the horizontal wheel will serve as moving scrapers to carry forward the ore and drop it into the battery. By this means the feeding of the ore is rendered positive whether it be wet or dry.

A COSTLY RAILROAD.—A costly railroad will be the extension of the Metropolitan District line in London—a section one mile and sixteen rods long, known as the "inner circle completion," as it will connect the Metropolitan and Metropolitan District roads (both underground lines) at their eastern ends, and make it possible to run trains entirely around the ellipse formed by the two roads, which at present are connected only at their western ends. This link is estimated to cost £2,100,000, or at the rate of about \$10,000,000 per mile. The city will, however, allow \$2,500,000 for a new street which has to be constructed in connection with the work, and which has to be done by August 7th, 1879. Costly as this work is, says the *Iron Age*, we have something quite comparable to it in expense in this country in the great St. Louis bridge, which, however, has but the merest fraction of the tariff which supports the London underground roads. This single mile of road will cost more than the entire system of elevated roads proposed for New York.

A DIAMOND drill is to be started on the 1,600-foot level of the California mine. The object is to find out what lies to the eastward. The east clay wall has never been found anywhere beyond a point 200 feet north of the south line. The diamond drill is to be sent in search of it. No drift has ever been run into this portion, for the reason that it was feared a flood of water would be let in that would drown the lower levels of the Ophir and all else in that vicinity. By using the drill the region in question may be prospected and a rush of water guarded against, as should there be a flow sufficient to give trouble the drill hole may be plugged up. The place in which this prospecting is to be done lies in the direction in which the recent development was made in the Ophir, but 500 feet above the new Ophir body.

MAGNETISM OF NICKEL AND COPPER.—Mr. Hall affirms in the *Monitor Scientific* that with feeble currents the magnetic power of nickel is equal to that of soft iron, but with stronger contents it is comparatively futile. Under any circumstances, however, the magnetic power of cobalt is much inferior to that of the other two metals.

THE Crown Point mine is yielding 50 tons of ore per day, which is being milled at the Mexican.



## MECHANICAL PROGRESS.

## Transmitting Power Long Distances.

Prof. Osborne Reynolds delivered a long and valuable address before the Manchester Scientific and Mechanical Society, on the transmission of power long distances. He analyzed all the means proposed carefully and arrived at the following conclusions: Twenty miles appears to be the outside limit to which power may be economically transmitted, even when the power can be had for nothing, and the most economical means of doing this is probably the wire rope. This review, therefore, shows the hopelessness of our ever utilizing the natural sources of power, such as tidal rivers for mechanical purposes, unless we conduct them on the banks of those rivers. But as regards the substitution of a general source of power for the small steam engines now in use in our towns, the case appears more hopeful; and, what is more, this has already been done in some instances. In the most notable instance, that of Schaffhausen, the power is obtained from the Rhine at a point close to the town and is conveyed along the banks of the river, which crosses the ends of the streets of the town by wire rope, which, as it passes the ends of the streets, gives motion to shafts which are laid in a channel under the pavement, and from which the power can at once be introduced into the various manufactories. In our own country, also, in the town of Hull, I believe that pipes have been laid down to convey the power derived from steam in the form of water, under a pressure of 600 pounds, over some part of the town. It does not appear unreasonable, therefore, to suppose that something of the same sort might be done in our own city. Considering that a very large proportion of the power required in our warehouses is for hydraulic presses, it would appear desirable that, in part at least, the power should be communicated to water pressure. Where rotary motion is required, the machinery might be driven by pressure engines, but as this would entail considerable waste, and as power may be more cheaply conveyed by compressed air, it might be better to supply both water and air; as regards the mechanical means, ropes and shafts. Although the former appears on the whole to be the most economical means of communicating work, and to a certain extent, their superiority is supported by the instance of Schaffhausen, considering their inconvenience in a town I think that the pipes would be preferable. With the ability to have either water or air at the most convenient pressure, and at a reasonable cost, I think that but few users of power on any but the largest scale would care for the trouble, danger, dirt and expense of having steam engines of their own; and if this be so, there would then be a chance of reducing the impurities in the air. Looking at these facts, I cannot help thinking that there is open to the engineer a field of enterprise, in which he may not only find remunerative employment for his talents, but in so doing confer a great benefit on his fellow creatures. This may not be so. The scheme, when closely considered, may be found wanting, but it will have served my principal purpose if it has helped to illustrate and render interesting what would have been otherwise desultory remarks about the transmission of work.

**STIMULATING PROGRESS AMONG YOUNG MECHANICS.**—Honorable competition in actual work is a great incitement to progress. This we think is well applied by an English society of turners. The subjects of competition were turning in ivory, pottery, stone and jet; and steel, brass and gold for horological purposes. The competition in ivory included vegetable ivory. The qualities considered in awarding the prizes were: Beauty of design, symmetry of shape, utility, and general excellence of workmanship; exact copying, so that two objects produced should be facsimiles in every part, or exact measures of capacity; fitness of the work or design for the purpose proposed; ability to turn, whether circular or oval; and novelty in application of turning or in design. Carving was admissible, but it was to be subsidiary to the turning. The candidate was to make his own selection from the above conditions; but the one who best fulfilled the largest number, including the most important qualities, was preferred. The work to be all hand turning, produced in the lathe without special rest or tool apparatus, and the carving to be the work of the exhibitor.

**HOW OUR MANUFACTURES GAIN ENTRANCE TO ENGLAND.**—In a large carriage manufactory in England, a few months since, says an exchange, the directors wished to introduce an American machine for the manufacture of wheels. A number of workmen were inclined to use it, as they could earn higher wages and their work was less laborious, but they were ordered by their trades unions not to use it, and the machine was, consequently, set aside. Since then American machine-made wheels have been imported, and their importation increases every day.

**PROGRESS.**—An exchange says: The car manufacturers at the West appear to have plenty of orders in hand, and the business has not looked so promising since the great collapse four years ago. The road shops are also full of work.

## The Manufacture of Mosaics.

The modern process of making mosaics now commonly followed in Rome is this: A plate, generally of metal, of the required size is first surrounded by a margin rising about three-quarters of an inch from the surface. A mastic cement, composed of powdered stone, lime and linseed oil, is then spread over as a coating, perhaps a quarter of an inch in thickness. When set, this is again covered with plaster of Paris rising to a level with the margin, upon which is traced a very careful outline of the picture to be copied, and just so much as will admit of the insertion of the small pieces of smalto or glass is removed from time to time with a fine chisel. The workman then selects from the trays, in which are kept thousands of varieties of color, a piece of the tint which he wants, and carefully brings it to the necessary shape. The piece is then moistened with a little cement and bedded in its proper situation, the process being repeated until the picture is finished, when the whole, being ground down to an even face and polished, becomes an imperishable work of art. The process is the same for making the small mosaics so much employed at the present day for boxes, covers or articles of jewelry, and this work is sometimes upon almost a microscopic scale.

The Florentine mosaic which is chiefly used for the decoration of altars and tombs, or for cabinets, tops of tables, coffers and the like, is composed of precious materials in small slices or veneers, and by taking advantage of the natural tints and shades which characterize the marble, the agate or the jasper, very admirable effects may be produced in imitation of fruit, flowers or ornaments. The use of this kind of mosaic is extremely restricted, on account of the great value and expense not only of the materials but of the labor which is spent upon them. None but the hardest stones are used; every separate piece must be backed by thicker slices of slate or marble to obtain additional strength, and every minute portion must be ground until it exactly corresponds with the pattern previously cut.

## Increase of Labor-Saving Machinery.

A feature of the Massachusetts census of manufactures for 1875, says the *Iron Age*, deserving especial notice, is the showing made in regard to the effect of labor-saving machinery on the production of some of the leading staples. We find that, with 24,151 hands employed in 1865, there was produced 175,875,000 yards of goods, a ratio of 7,355 yards to each employee. In 1875 there was produced 874,780,000 yards by 60,176 employees, or about 11,213 yards to each hand. This shows that with an increase of a little over 149% during the 10 years, in the number of hands employed, the quantity of cloth produced was increased nearly 392%. Woolen goods also make a very striking exhibit. For 1865, the production is placed at 46,008,141 yards, and the number of employees 18,733. For 1875, the production is 90,208,250 yards, and 19,036 employees, showing an increase of 96½% in production to 1½% in the number of employees. The number of pairs of boots and shoes made in 1865 was 31,870,531, and number of employees 58,281; and in 1875, 59,762,866 pairs, with 48,090 employees. This is probably the most important showing made, the production during the 10 years having been increased nearly 88%, while the force employed was less by 4,731. The product of carpetings in 1875 increased fourfold as compared with 1865, while the increase of force employed was less than half that amount. The average value of the boots and shoes produced in 1845 was 70 cents a pair; in 1855, 80 cents; in 1865, \$1.80; and in 1875, \$1.50. The value of carpetings was \$2 per yard in 1865, and less than 73 cents per yard in 1875—which shows the source of the immense supply of dollar carpetings. The great reduction in the number of employees in the clothing business shows to what an extent the sewing machine, the machine shear and mere careful gradations of "ready-made" have superseded the need of the tailor and the needle-woman.

**LABOR, CAPITAL AND ENTERPRISE.**—The author of "The Man Without a Country," has a story for the times commenced in the November *Harper*, entitled "Back to Back." The moral of the story is, that even in these dull, hard times, if capital, enterprise and labor will stand "back to back," they will succeed. There is capital enough and labor enough, but capital is fearful, and labor is powerless without capital, so alone they accomplish nothing. What is wanting is the third person, enterprise and executive ability, to act as a connecting link between the necessary ingredients, to start the wheels of industry. And those three must stand "back to back," assisting each other, and with perfect confidence that each one will do his full share in the struggle, to insure success. That can never be achieved while the three parties in interest are quarreling among themselves, or jealous, suspicious and distrustful of each other. In the first place, capital wants to know that enterprise and skill have the power for production, that the raw material can be had, and that the labor to transmute it can be obtained, and that it is willing to assume a portion of the risk, with the assurance of sharing in the success. And, on the other hand, labor must have the same assurance that the other two parties are in earnest, and are willing to assume the same risk, and not look for profit until it is made and shared in by labor.

## SCIENTIFIC PROGRESS.

## What is a Diatom.

One of the first beauties which are put on the microscopic stage for the gratification of a visitor is apt to be a group of diatoms, and beautiful as these minute shells are to the tyro, they possess doubled charm to the skilled microscopist, and give him opportunity for years of study. At the last meeting of the San Francisco Microscopical Society, President Ashburner read a very interesting paper, being a translation, by him, of an essay on the subject "What is a Diatom?" by Mons. Julien Deby, taken from the "Proceedings of the Belgian Microscopical Society," and, were it not for its great length, would find a place in our columns. The paper was illustrated by drawings on the blackboard, by Mr. Kinne, and was a careful resume of all that is known of the life and history of these wonderful forms of vegetable life, as ascertained by the investigations of Mr. Deby, and which confirmed the researches of such distinguished contemporaneous diatomists as Thwaites, Wallich, Hofmeister, McDonald, Wm. Smith, Piltzer and H. L. Smith. Aside from the elaborate description of the parts of the diatom, and their method of reduplication and conjugation, which was listened to with great interest by all present, the following general remarks are published, as they may give rise to more extended thought and study of these truly wonderful organisms:

"The little microscopic organisms, of which we propose to say a few words, are distinguished from non-cellular algae, properly so-called, as infusoria are distinguished from rhizopods, by certain well-marked characteristics. They form one of the numerous links which exist between what we are still disposed to call empirically the animal and vegetable kingdoms.

"The only connection between the surrounding and nourishing liquid in which the diatoms live, exists in the circumference, so to speak, of the connectives (between the valves of the frustule); also in certain pores, somewhat problematical, along the line of the connectives with the corresponding valves, and always in the form of lineal joinings, which are only visible by means of our most powerful modern objectives. Neither pores or openings are probably ever found in the frustules of diatoms, notwithstanding the assertions of certain microscopists. Neither does solid matter ever penetrate from the exterior into the interior of living diatoms; they drink, but they do not eat.

"The curious active movements of certain diatoms always occur in an obvious manner (the principle of which is, however, obscure), by a vital action along the joinings mentioned. This is so true that if, owing to any cause, a frustule is stopped in its course by an unsurmountable object, the translating force is immediately seen to be converted into another, which causes all the small bodies about it, which are floating in the water, to move backward and forward with great rapidity.

"We believe that diatoms possess other means of reproduction beside that of conjugation, but the life history of these minute beings is too imperfect for us to venture any hypothesis in this direction. The modern appearance of species where none existed before; their periodical succession, year after year, at definite seasons, without being able to find any in the interval in the same locality, give rise to the possibility of a mode of generation, which is as yet only suspected, by means of germs—by micro or macro zoospores, and, perhaps, in the first instance, with the formation of zygozoospores, as occurs in the case of living algae of the lower orders and situated under the same conditions as the diatoms.

"We foreshadow here a most interesting field of study, and one which is almost new to the naturalist provided with a good microscope and possessing the time and patience necessary for this kind of study; and we think we can say with confidence that whoever will follow with care the entire life-history of a single diatom, no matter how common the species, will render a greater service to science than by describing and drawing hundreds of the siliceous frustules from the four quarters of the globe."

**DISTANCES IN THE SOLAR SYSTEM.**—At a recent meeting in New York city, Prof. Stephen Alexander, in a paper, entitled "Laws of Extreme Distances in the Solar System," showed the relation of various members of the solar system and the curious proportions existing between them, the whole indicating that in their organization they have obeyed the rule of law. The ratios of the planetary distances for example he pointed out as follows: Neptune to Uranus, two-thirds; Uranus to Saturn, one-half; Saturn to Jupiter, one-half; Jupiter to Asteroid, one-half; Asteroid to Mars, two-thirds; Mars to earth, two-thirds; earth to Venus, two-thirds; and Venus to Mercury, one-half; and then he showed that the difference between the distances according to law, and in fact, were small, not exceeding in any of the preceding instances .078. Tables of relations for the systems of Jupiter and Uranus were given, which also showed remarkable approximations of theory to fact.

## The Origin of Storms.

At the late meeting of the National Academy of Sciences, held at Columbia College, New York, Prof. Elias Loomis read a paper on the origin of storms, based upon data obtained by the United States Signal Service. He stated that our great storms begin in the neighborhood of the Rocky mountains, and that no example is found of any considerable storm arising on the Pacific coast, south of Oregon. At the outset there is generally an area of several hundred miles diameter, through which the barometer stands at mean. On opposite sides of this area, generally east and west, at a distance of 1,000 miles apart, are areas of high barometer. The atmosphere in these side areas begins to move toward the central area. The currents thus established are deflected toward the right by the earth's rotation, and a diminished pressure results over the central area when the inflow increases and comes from all sides. The area of low pressure assumes an oval form, but if the winds are very violent, it may be more nearly circular. With rotation a centrifugal force is developed, which increases the pressure, and within the latter there is an upward movement of the atmosphere which carries large amounts of vapor, which, on cooling, condenses as rain. The heat liberated by condensation increases the rarefaction of the area, and thus rain increases the force of the storm though never originating it. The upward motion within the storm area takes place chiefly on the east side, so that the depression at the center is constantly transferred toward the east, unless, however, there is a great precipitation of vapor on the west side of the area, in which case the storm is held stationary or even moved westward.

**INTOXICATING GRASSES.**—Dr. Hance gives in the *Journal of Botany* for September a supplementary note on intoxicating grasses. The plant treated of on this occasion is *Stipa Siberica*, Munro, which had been found to poison horses at Gulmiz, Kashmir. Prof. Dyer suggested that the *Stipas* may be only mechanically poisonous, like *Hordeum pratense*, but Dr. Hance thinks the symptoms opposed to such a supposition. In the recently published English translation of Przevalsky's travels, the Alaskan poisonous grass is stated to be a species of *Lolium*, but the native herds carefully avoid eating it, as the cattle of Kashmir refuse the *Stipa*. In part 22 of Messrs. Trimen & Bentley's "Medicinal Plants," recently published, there is given a figure of *Lolium temulentum*, Linn., and an account of its so-called poisonous properties. Mr. A. S. Wilson, of Aberdeen, ate large quantities of it daily for some time and found it quite harmless. It is suggested that in this case the poisonous property is due to ergot. It would indeed seem that grasses are poisonous only in two ways—mechanically (like *Hordeum pratense*), or when afflicted with ergot or some other disease. Farther experiments are much to be desired.

**EVIDENCES OF A LUNAR ATMOSPHERE.**—Prof. Alexander brought forward at the last meeting of the National Academy of Sciences, a variety of evidence tending to indicate some envelope, like an atmosphere for the moon. The evidence was principally drawn from observations during eclipses. The explanations usually offered for the bright band seen around the moon at such times were fully considered, and shown to be inadequate, though good as far as they would apply. The ruddy band of light is much too broad to be the sun's chromosphere. Various experiments proved that it was not a consequence of contrast alone. It was most apparent in those instances where the moon was nearest the earth. It could best be accounted for by supposing an atmosphere to the moon—a thin remnant of ancient nebulousity, comparable to that which accompanies the earth and gives rise to the appearance of the aurora borealis.

**MITT TRANSFORMATION.**—At a recent meeting of the St. Louis Academy of Science, Prof. Riley gave an account of his observations and experiments on *Astoma gryllaria*, Le Baron. He has, during the summer, proved by experiment that, as he first suggested over three years since would be the case, this little six-legged mite, which preys parasitically on the winged locusts, is the larval form of *Trombidium sericeum*, Say, a larger six-legged mite that preys upon the eggs of the locust. Hatching from minute eggs laid in loose masses in the ground, the *Astoma* form crawls on to the locust, fastening and swelling as a tick does on a dog. The *Astoma* at last drops from the locust to the ground, where it slowly goes through its transformation into the *Trombidium*. As wherever the locust abounds this *Trombidium* also necessarily prevails upon the ground ready to pounce upon the locust eggs, it is no wonder that the female locust instinctively avoids such localities in ovipositing.

**HOW TO KILL ENTOMOLOGICAL SPECIMENS.**—A correspondent says the method of killing entomological specimens, by putting them in a glass cylinder closed at one end, and then inserting a wad of tow saturated with ether on closing the other end of the cylinder, is very good; but when putting the insect, especially butterflies, in the tube, it flutters its wings, and so loosens some of the colors. A better way is to put a small bit of chloroform on the insect's head as soon as it is caught, and the effect is that it instantaneously dies. Not even a relaxation of the muscles being perceptible.



## Table of Highest and Lowest Sales in S. F. Stock Exchange.

Name of Company.	Week Ending Nov. 1.	Week Ending Nov. 8.	Week Ending Nov. 15.	Week Ending Nov. 22.
Alpha.....	121 97	114 101	131 111	121 111
Alta.....	84 71	11 81	15 11	18 14
Andes.....	80c 55c	80c 60c	65c 1 14	65c
Baltimore Con.....	1 90c	1 60c	2 1.10	2 1.10
Belcher.....	54 41	52 41	54 51	59 50
Belmont.....	181 15	181 15	171 20	171 20
Best & Belcher.....	181 15	181 15	171 20	171 20
Bullion.....	84 4	6 4	6 6	6 6
Caledonia.....	3 2.10	2.60 2.20	4.00 2.60	4 3.85
California.....	231 23	271 261	301 271	271 271
Challenger.....	1 75c	1 75c	1 75c	1 75c
Chollar-Potosi.....	30 27	33 25	36 33	34 32
Confidence.....	6 41	54 51	54 51	54 51
Con Imperial.....	90c 65c	85c 75c	80c 85c	85c
Con Virginia.....	24 24	24 24	24 24	24 24
Crown Point.....	51 41	4 40c	61 51	62 51
Coso Con.....	5c	5c	5c	5c
Dayton.....	60c 45c	45c 45c	45c 45c	45c
Eureka Con.....	46 44	4 40	4 40	4 40
Excelsior.....	9 41	4 40	4 40	4 40
Geddes & Bertrand.....	6 41	54 51	54 51	54 51
Gen Thomas.....	131 111	12 13	11 13	12 13
Grand Prize.....	1 70	1 30	1 60	1 14
Gila.....	1 70	1 30	1 60	1 14
Globe Con.....	40c	45c 25c	75c 90c	80c
Golden Chariot.....	40c	45c 25c	75c 90c	80c
Gould & Curry.....	91 7	84 10	101 91	81
Hale & Norcross.....	45c 20c	40c 30c	40c 30c	30c
Hussey.....	2.15 1.70	2.30 2 20	2.60 2.30	2.30
Justice.....	101 71	91 81	131 121	101 101
Jackson.....	3 41	4 41	4 41	4 41
K. K. Con.....	3 41	4 41	4 41	4 41
Kentuck.....	64 51	64 51	64 51	64 51
Knickerbocker.....	30c 25c	25c 25c	25c 25c	25c
Kossuth.....	30c 25c	25c 25c	25c 25c	25c
Lady Bryan.....	3 41	4 41	4 41	4 41
Lady Wash.....	1 70c	1 75c	1 85c	1 14
Leopard.....	1 70c	1 75c	1 85c	1 14
Leviathan.....	50c 35c	40c 35c	50c 40c	50c
Leeds.....	2.90 2.70	2 2.60	2.90 2 2.90	2 2.90
Modoc.....	111 101	101 101	121 111	12 101
Manhattan.....	111 101	101 101	121 111	12 101
Manfield.....	30c 20c	25c 25c	25c 25c	25c
Mendoc Valley.....	30c 20c	25c 25c	25c 25c	25c
Mexican.....	50c 10c	111 81	111 81	111 81
North Con Virginia.....	50c 10c	30c 25c	90c 75c	75c
New York.....	40c 30c	50c 25c	1.85 90c	1 0.05
Niagara.....	16 15	151 141	16 151	141 14
Northern Belle.....	16 15	151 141	16 151	141 14
New Coso.....	90c 45c	60c 50c	70c 55c	50c
Ophir.....	15 121	101 121	42 261	201
Ophir.....	15 121	101 121	42 261	201
Overman.....	171 141	151 141	161 23 19	23 19
Pacific.....	90c 45c	60c 50c	1 90c	80c 90c
Panther.....	90c 45c	60c 50c	1 90c	80c 90c
Peoria.....	50c	50c 40c	40c 40c	40c
Prospect.....	50c	50c 40c	40c 40c	40c
Raymond & Ely.....	20c 15c	40c 25c	25c 20c	20c
Rock Island.....	20c 15c	40c 25c	25c 20c	20c
Sage.....	84 71	84 71	84 71	84 71
Seg Belcher.....	53 25	31 30	34 37	34 37
Sierra Nevada.....	43 3.30	4 3.80	54 4.65	54 4.65
Shier Hill.....	4.95 1 2	1 70c	2 3 2.30	2 3 2.30
South Chariot.....	2.85 2 1	3 2.55	4 3 6.50	3 6.50
Sucon.....	1.40 1 1	1.20 1.40	1.20 1.55	95c
Trojan.....	51 4.30	51 4.30	51 4.30	51 4.30
Union Con.....	51 4.30	51 4.30	51 4.30	51 4.30
Wells-Fargo.....	50c	40c 60c	70c 40c	40c
Woodville.....	90c	80c 65c	1.30 80c	1 1.0
Yellow Jacket.....	91 81	9 121	91 101	121

## Sales at S. F. Stock Exchange.

Friday A. M., Nov. 16.		210 Chollar.....	32
540 Alpha.....		121 97	114 101
510 Alta.....		11 81	15 11
210 Best & Belcher.....		171 20	171 20
260 Belcher.....		54 41	52 41
1850 Bullion.....		84 4	6 4
100 Confidence.....		6 41	54 51
95 Chollar.....		30 27	33 25
1005 California.....		231 23	271 261
1470 Con Virginia.....		51 41	4 40c
1135 Crown Point.....		51 41	4 40c
435 Con Imperial.....		90c 65c	85c 75c
1800 Caledonia.....		3.85 3.35	50c 40c
250 Daney.....		5c	5c
405 Excelsior.....		4 40	4 40
1210 Gold & Curry.....		81 61	81 61
1465 Hale & Norcross.....		45c 20c	40c 30c
1155 Justice.....		111 101	101 101
1255 Julia.....		2.90 2.75	101 101
115 Kentuck.....		64 51	64 51
1215 Mexican.....		121 101	101 101
715 Ophir.....		271 261	261 261
290 Overman.....		171 141	151 141
100 Sucon.....		31 30	34 37
275 Savage.....		4 40	4 40
285 Sierra Nevada.....		4.80 4.40	4 4.65
40 Seg Belcher.....		34 37	34 37
500 Union Con.....		61 51	61 51
200 Leeds.....		101 101	101 101
1410 Yellow Jacket.....		91 81	9 121
AFTERNOON SESSION.		210 Chollar.....	32
		540 Alpha.....	121 97
2130 Alta.....		11 81	15 11
620 Argenta.....		1.70 1.65	1.70 1.65
135 Alps.....		30 25	30 25
400 Andes.....		70 65c	70 65c
2000 Boyle.....		75c 115	115 115
940 Benton.....		1.95 1.92	1.95 1.92
100 Northern Belle.....		16 15	151 141
50 Belmont.....		50c	50c
805 California.....		251 251	251 251
1735 Con Virginia.....		221 221	221 221
300 Day.....		4 44	4 44
200 DeFrees.....		130 130	130 130
720 Eureka Con.....		41 40	41 40
340 Grand Prize.....		131 131	131 131
240 Gila.....		111 111	111 111
200 Horne.....		35c	35c
1300 Hussey.....		35c	35c
1550 Independent.....		1.20 1.20	1.20 1.20
60 Jackson.....		32 30	32 30
505 Joe Scates.....		50c	50c
340 K. K. Con.....		3 41	3 41
85 Leonard.....		1.30 1.25	1.30 1.25
135 Alps.....		30 25	30 25
225 Lady Wash.....		80c	80c
1475 Leviathan.....		50c	50c
3250 Modoc.....		60 55c	60 55c
50 Manhattan.....		12 10	12 10
110 Meadow Valley.....		25c	25c
170 Northern Belle.....		14 13	14 13
2240 New York.....		1.15 1.05	1.15 1.05
5080 Navajo.....		1.15 1.11	1.15 1.11
1000 Ophir.....		2.10 2.10	2.10 2.10
460 Overman.....		171 141	151 141
85 Occidental.....		1 30	1 30
50 Panther.....		80c	80c
45 Raymond & Ely.....		8 85c	8 85c
30 Rock Island.....		24 24	24 24
2470 Sierra Nevada.....		2.12 2.10	2.12 2.10
150 Solid Silver.....		80c	80c
300 Senator.....		31 31	31 31
300 Shier Hill.....		4.95 4.95	4.95 4.95
100 Silver King.....		1 131	1 131
350 Trojan.....		1 10	1 10
325 Tiptop.....		1 20	1 20
200 Woodville.....		1.01 1.01	1.01 1.01
500 Yellow Jacket.....		91 81	9 121
AFTERNOON SESSION.		210 Chollar.....	32
		540 Alpha.....	121 97
2130 Alta.....		11 81	15 11
620 Argenta.....		1.70 1.65	1.70 1.65
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400 Andes.....		70 65c	70 65c
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805 California.....		251 251	251 251
1735 Con Virginia.....		221 221	221 221
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85 Leonard.....		1.30 1.25	1.30 1.25
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150 Solid Silver.....		80c	80c
300 Senator.....		31 31	31 31
300 Shier Hill.....		4.95 4.95	4.95 4.95
100 Silver King.....		1 131	1 131
350 Trojan.....		1 10	1 10
325 Tiptop.....		1 20	1 20
200 Woodville.....		1.01 1.01	1.01 1.01
500 Yellow Jacket.....		91 81	9 121

1510 Con Virginia..... 221 221

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## MINING SHAREHOLDERS' DIRECTORY.

Compiled every Thursday from Advertisements in Mining and Scientific Press and other S. F. Journals.

## ASSESSMENTS-STOCKS ON THE LISTS OF THE BOARDS.

COMPANY.	LOCATION.	No.	AMT. LEVIED.	DELINQ'T.	SALE.	SECRETARY.	PLACE OF BUSINESS.
Alta S M Co	Washoe	8	50 Oct 20	Nov 24	Dec 12	W H Watson	302 Montgomery st
Andes S M Co	Washoe	9	25 Nov 5	Dec 13	Jan 2	M Landers	309 Montgomery st
Bullion S M Co	Washoe	5	15 Oct 2	Nov 5	Nov 28	J S Kennedy	310 Pine st
Baltimore Con M Co	Washoe	17	50 Oct 5	Nov 8	Nov 27	C A Sankey	331 Montgomery st
Chollar-Potosi M Co	Washoe	13	30 Oct 2	Nov 12	Nov 27	W E Dean	419 California st
Caledonia S M Co	Washoe	21	75 Oct 11	Nov 12	Nov 30	R Wegener	309 Montgomery st
Cosmopolitan M Co	Washoe	5	25 Oct 11	Nov 5	Nov 28	M Landers	310 Pine st
Con Imperial M Co	Washoe	5	20 Oct 23	Nov 29	Dec 21	W E Dean	419 California st
Combination M Co	Nev	1	10 Oct 10	Nov 12	Dec 4	J G Riley	320 California st
Con Washoe M Co	Nev	1	20 Oct 29	Dec 6	Dec 27	L Hermann	220 Sansome st
Golden Chariot M Co	Idaho	21	50 Oct 8	Nov 9	Nov 28	J T McGeehan	Merchants' Ex
De Fries M & Co	Nev	3	25 Sept 26	Oct 30	Nov 19	T E Atkinson	310 Pine st
Hale & Norcross M Co	Washoe	56	10 Oct 2	Nov 6	Nov 28	W E Dean	309 Montgomery st
Dayton M Co	Nev	9	25 Nov 9	Dec 14	Jan 4	W E Dean	419 California st
Independence M Co	Nev	2	25 Oct 29	Dec 3	Dec 24	R H Brown	327 Pine st
Justice G M Co	Washoe	22	50 Oct 30	Dec 5	Dec 26	J S Kennedy	419 California st
Leopard M Co	Nev	4	25 Oct 13	Nov 24	Dec 8	R H Brown	327 Pine st
Mides M Co	Nev	2	50 Oct 2	Nov 11	Dec 11	L Kean	327 Pine st
Minnetta Belle M Co	Cal	2	25 Oct 2	Nov 2	Nov 27	J S Riley	Merchants' Ex
Mint G & S M Co	Washoe	19	10 Oct 31	Dec 4	Dec 28	D A Jennings	320 California st
Modoc Con M Co	Cal	53	50 Nov 16	Dec 21	Jan 14	E F Dickens	401 California st
Narajo M Co	Cal	2	50 Oct 26	Dec 1	Dec 24	R H Brown	327 Pine st
New Coso M Co	Cal	6	50 Oct 30	Dec 3	Dec 27	F Verdinal	327 Pine st
New York M Co	Washoe	13	40 Oct 3	Nov 10	Nov 30	D L Thomas	327 Pine st
Overman M Co	Washoe	39	300 Nov 3	Dec 8	Dec 23	G D Edwards	419 California st
Sierra Nevada S M Co	Washoe	51	50 Nov 16	Nov 21	Dec 16	E B Holmes	414 California st
Sierra Nevada S M Co	Washoe	31	10 Nov 11	Dec 11	Dec 15	W W Stetson	309 Montgomery st
South Navajo M Co	Nev	2	10 Nov 16	Dec 28	Dec 18	R E Johnson	309 Montgomery st
Tuscarora Con M & M Co	Nev	1	10 Oct 1	Nov 6	Dec 1	H B Land	404 Montgomery st
Union Con M Co	Washoe	10	25 Oct 16	Nov 19	Dec 10	J M Buffington	306 California st
Yah S M Co	Nev	18	200 Nov 12	Dec 17	Jan 7	G C Pratt	309 Montgomery st
Washoe C Co	Washoe	2	15 Nov 3	Dec 17	Jan 7	G C Sankey	331 Montgomery st
Yellow Jacket M Co	Washoe	27	200 Sept 26	Oct 29	Nov 7		



# MINING SUMMARY.

The following is mostly condensed from journals published in the interior, in proximity to the mines mentioned.

## California.

### ALPINE.

**SUCT DOWN.**—Alpine Chronicle, Nov. 10: Work has been suspended at the L X mine until a more powerful pump can be obtained, the heavy influx of water in the shaft making it too expensive to continue the sinking under the present pumping facilities. The miners have been discharged and paid off in full.

**A REMOVAL.**—Alpine Chronicle, Nov. 17: It is reported that the Schenectady (or Tarshish) mine and mill have been sold—either to a San Francisco or a Gold Hill company. It is to be hoped that such is the case, as it is too valuable a property to be lying idle. Parties in San Francisco have been negotiating for it, having had it thoroughly examined by a practical man. It was also recently examined by two well known Comstock mining men from Virginia City who expressed themselves highly pleased with the mine. We are assured that the entire property will be sold to a good company who will energetically work it.

**TIME.**—Times in this county are very dull just at this time, owing to the fact that some of our mining companies are in law up to their ears, and are not doing much work. But we are in hopes that this inactivity will be of short duration.

### AMADOR.

**NEW MINE DISCOVERED.**—Amador Dispatch, Nov. 17: We are informed that Mr. F. Lorrain and others have recently discovered a new mine of excellent looking quartz near the Jackson Gate.

**MONTEICARLO.**—The work of developing the Monte-richard mine is progressing rapidly and the prospects continue to be very flattering. Mr. McNamara & Co. have about finished their contract for sinking, and the shaft is now down about 250 feet below the surface, at which depth they have a ledge of very rich rock three and a half feet thick. They have also about 300 tons of good rock on the dump ready for crushing.

**THE BOSTWICK MINE.**—Mr. H. I. Bostwick brought several specimens of very fine looking quartz rock into the office the other day, taken from his mine at Skoville about a mile from Jackson. The specimens brought are literally full of gold-bearing sulphurets, similar to those usually found in the Coney mine, and a liberal quantity of free gold. The rock was taken out at a depth of 35 feet from the surface, at which depth the ledge is between three and four feet wide, with every prospect of it increasing both in width and richness as the work of sink-ing progresses. There are also several other mines on the same level, all of which prospect well, and would undoubtedly prove to be valuable mines if thoroughly developed. Besides, these mines can be worked on a comparatively cheap scale, being favorably situated as regards water-power, etc. We think some of our capitalists who are "bucking" off their cash in the San Francisco stock boards would find it to their advantage to come up and look at some of these mines.

### BUTTE.

**ORO MINING COMPANY.**—Oroville Mercury, Nov. 16: E. W. Slater, who is driving into the company's ledge, was in town last Monday, and from him we learn that he is 500 feet and has only 125 feet more to blast. The rock has been the hardest ever seen by Mr. Slater. Powder seemed to have but little effect on it. It had to be nearly all drilled out. This was the case for only a short distance. Every few feet they now find a vein of quartz rock, and think, when the end is reached, to find as good a quantity of ore as seen in Butte county. The tunnel has been an expensive one, but great hopes are entertained of its reaching good rock.

**BUTTE CREEK MINES.**—Butte Record, Nov. 17: Work is progressing rapidly on Messrs. Shepard & Co.'s ditch, on Butte creek, and before many days the untold wealth lying in the gravel on either side will be pouring into Chico. Every foot of mining ground in the vicinity has been taken up and formerly located claims are in demand.

### CALAVERAS.

**GARLAND'S MILL.**—Calaveras Chronicle, Nov. 17: The new mill that Mr. Garland has been erecting on his gravel claim in Chile gulch is completed, and the machinery was started up for the first time the other day. Active operations have not been commenced, the starting of the machinery being held in reserve for the purpose of seeing how it would run. Aside from the leaking of the pipe which conveys water to the mill, everything was found O. K. The battery will be set at work in a few days.

**COMMERCIO PIPINO.**—One by one hydraulicists are wheeling into line for the winter's campaign. Veith, proprietor of the mammoth hydraulic on Tunnel ridge, topped his line Wednesday.

**GRWIN MINE.**—No new developments have been made since our last report. The mine continues an average yield of about \$25,000 per month, and the indications met with in the shaft, levels and stopes are highly flattering. The vein is wide, ore good and the working appurtenances of the mine the best that skill and money can afford. The Grwin still stands at the head of the bullion producing mines of California.

**RAIN.**—The heaviest showers of the season fell last Saturday night and Sunday. The ground is now wet deep enough to admit of plowing and the ditch is about full of water. There is nothing in the world to prevent miners and ranchers from working now, barring an occasional case of constitutional aversion to labor, and from this time forward there will be no rest for either the plow or pick.

**DURYEA MINE.**—Operations have been steadily pushed at the Duryea mine since work was commenced a week or two since. The mill is kept constantly running. Eighteen men are employed in the mine and mill, and there are no Chinamen among them. By next Saturday we hope to be able to chronicle the fact that all the hydraulics in this vicinity are in operation.

**QUARTZ MINE SOLO.**—Messrs. Wallace, Ferguson & Early have sold their quartz mine, located at Sheep ranch, for \$108,000.

**MOSQUITO GULCH IRMS.**—The Hortense mine is a new discovery; about 750 feet from 00 feet. A small lot of rock, say about 13 tons, crushed at the San Bruno company's mill, paid about \$24 per ton. L. and F. are still vigorously working the mine. On another ledge, another new discovery. No crushing about 20 feet. Vein, four feet in width. No crushing as yet, but rock prospects well. J. L. Hoy and J. V. Tower owners. Blue Jay is still being vigorously worked and yielding as good ore as ever. A whim is now being placed on the mine. A third interest was recently sold for \$5,000. Present owners—Potter, Rogers and Spaulding.

### EL DORADO.

**THE LOOMIS CLAIM.**—Mountain Democrat, Nov. 17: The E. D. W. & D. O. M. Co. is having a ditch dug and flume built for the purpose of working the Loomis claim on the south side of Texas hill. It will be ready for operation in a few weeks.

**CHURCH-UNION.**—H. S. Morey, at his foundry, is still turning out large and heavy castings for the hoisting works at the Church-Union mine. The improvements at this mine have been thorough and elaborate, utterly regardless of cost, all of which seems to be justified by the yield and prospects. The chief owners are men of great wealth, who seem greatly dated with the success of their enterprise.

**HENRY'S DOGIRON—CARRIE HALL HYDRAULIC.**—The above named company is making extensive and expensive preparations for the coming season. By the construction of one and one-half miles of new ditch and flume, some of the latter being carried at a height of 35 feet, they have added about 40 feet to the pipe pressure,

and Mr. Bradley, the Superintendent, is sanguine of a very profitable winter. For several weeks workmen have been preparing the Placerville M. Co.'s claim south of town for a winter's run. The flumes have been carried up to the face of the bank, and are now completed. At three points powder drills were put in to a depth of about 60 feet and T's excavated. Thursday and yesterday these T's were charged with 345 kegs of powder, each deposit being inserted by insulated wire with a dynamo's electrical machine. Mr. Swan gave the crank a few turns, pressed the "fire key" and the immense mass of superincumbent gravel was pulverized and ready for the water.

### INYO.

**BULLION SHIPMENTS.**—Coso Mining News, Nov. 17: Mr. Taylor, Superintendent of the Enigmatic mine, brought in on Tuesday one bar of bullion valued at \$1,500. On the same day the Rex Montis shipped two bars of bullion valued at \$1,000.

**MINIATURA.**—A quarrel of some sort among directors, stockholders, or somebody else, in regard to Miniatura, has so far created a little scare relative to their financial standing, but we are assured that the company will set things all to rights, money having been negotiated for sufficient for all present demands.

### LAKE.

**GREAT WESTERN QUICKSILVER CO.**—Napa Register, Nov. 17: Some 225 men, mostly Chinamen, are employed by the company; 120 tons of ore are reduced per day, and from 500 to 600 flasks of quicksilver are bottled every month. Mr. Rocca, Superintendent, has lately introduced a new condensing power, which will be known as the Green, Halsey and Rocca condenser, and for which they have applied for a patent. Under its present management, during the last year the company has paid off all its debts, made \$20,000 worth of improvements, and disbursed a \$30,000 dividend. The monthly pay roll foots up \$10,000. In the vicinity of the mine there are 20 or 30 families living in as many costly constructed houses or cabins, and a school numbering 24 scholars is taught by Philip Ackey. A well-stocked store, owned by the Superintendent and Secretary, is patronized exclusively by the employees of the company, the prices charged always being the lowest market rates. A great quantity of rice is consumed by the Chinamen employed; the storekeeper saying that he reckoned the consumption of that article at one mat (50 pounds) to the man every month. The storekeeper is assisted by a Chinaman clerk. There is no cessation of work at the mine, there being two shifts of men, one for the day and the other for the night; Sundays as well as week days. The fires of the furnaces are never allowed to go out, and every man is to be found at his post with the regularity of clockwork.

### NEVADA.

**BLAST.**—San Juan Times, Nov. 17: The American mining company, near Sebastopol, set off a blast of nearly 500 kegs of black powder a few days ago, which did immense execution. They have recently struck a vein of very rich gravel, and the mine is looking much better than it did when the company was working among the boulders. The members of the company are feeling quite cheerful, which denotes that they are prosperous.

**NEW ENGLAND.**—Nevada Gazette, Nov. 17: This company are putting in a run of five stamps in connection with their hoisting works. This will effect a saving of at least \$2 per ton and practically make their rock richer by that amount.

**THE Nevada gravel mining claim, in the vicinity of Sugar Loaf, promises to be a good thing for the stockholders. This claim, formerly owned by Amos T. Laird, was partially developed years ago, but owing to circumstances, not known to us, work was suspended till last summer. A joint stock company was formed and the old works were reopened. The Superintendent, the Superintendent, has been pushing the work vigorously up to the present time. We are informed that the channel has been reached and that the prospects are exceedingly favorable. There is no reason to doubt that as rich deposits of the precious metal will be unearthed as were found in the Nebraska and Live Oak claims.**

**GRASS VALLEY.**—Bar Mills, Grass Valley Union, Nov. 17: Tuesday last an important transaction took place; important to the mining interests of Grass Valley. The Rocky Bar mining company's ground has changed hands by that transaction. The capital stock of the company is divided into 11 shares, and nine of these have been sold to parties in Grass Valley for \$2,000 per share. The mining ground of which the control has thus been changed is situated on the Messinguer and Merriam hills, famous hills in former times for their richness in quartz, and has been known generally as the Chavanne ground. The new owners, Kelly & Co., will put machinery at work in a very short time. The Rocky Bar ground has a splendid history, and of late very rich ore has been taken out of it. A working miner, who knows all about the present condition of the Rocky Bar, says the late purchase was like buying good ground for a mere song.

**MINE SOLO.**—Nevada Transcript, Nov. 15: Geo. W. Smith has sold his valuable quartz mine to a wealthy San Francisco company, and it will hereafter be under the superintendence of Mr. Amroho. The company has been incorporated under the name of the Royal mill and mining company, with a large capital. The hoisting works will be taken down from the present place and moved 100 feet from the old location. It was for a mere song necessary to make the change on account of the treacherous ground where the old works were situated. The mine is looking splendidly and, in about 10 days, work of the most extensive character will be commenced. We understand the new company propose to buy other properties in this county, if they can find anything that suits them.

**LITTLE YORK MINE.**—Dutch Flat Forum, Nov. 15: The Little York company's mines, at this place, are fitted up, prepared to wash at four different points as soon as water can be had. This company has expended a large amount in putting their mines in readiness for the coming season's washing.

### PLACER.

**MINES NEAR DUTCH FLAT.**—Forum, Nov. 15: The mining companies of Dutch Flat found their various mines in readiness to utilize the first water that passes through the ditch.

**TUE CEDAR CREEK COMPANY** have completed the laying of blocks the full length of the Yankee tunnel.

**NORTH STAN NO. 2** has suspended washing for the present, the supply of water being used in clearing the Gold Run M. D. company's tunnel at Gold Run.

**THE Franklin** is nearly ready for washing.

**A BLAST** of 1,305 kegs of powder was exploded in the Polar Star mine on the 6th instant, doing splendid execution.

**THE work of advancing the tunnel to tap the Hayward mines at Yot** is suspended for the present, owing to the laying of 1,200 feet of flume in it preparatory for the washing season. At the completion of the flume, as mentioned heretofore, the work of advancing the tunnel will be resumed, and the rock removed the entire length of the flume by the mine.

**REYNOLDS HILL MINES.**—The Rhode Island company is busily engaged at present in repairing their ditches and flumes; at the completion of which, if there is not sufficient water for hydraulicing, drifting will be continued until there is.

**BORN TUNNELS** in the Wide West mine have been advanced 525 feet each; the gravel being tapped by them continues to be quite rich. The second drift opened at tunnel No. 2, for the purpose of opening up more ground for breasting out, is advanced 170 feet, at which point the drift is being run north for the purpose of opening out said breasts. The gravel taken out of the old breasts continues to pay splendidly.

**LOWELL HILL MINES.**—The Swamp Angel company have completed the construction of two large water tanks, extended their air pipes, improved the working of the air blast, and resumed extracting gravel one week ago. The tanks constructed are sufficient in size to insure in the future the continuous washing of the gravel as extracted.

**THE East Nevada company's tunnel** has been advanced 600 feet and is being steadily driven ahead.

**No work** has been done in the tunnel at the Wild Cat mine since our last report. The company have been kept busy of late making extensive preparations for winter, in building a blacksmith shop, new residences, and the laying in of a large supply of posts, cises, lagging and wood.

**The tunnel in the Planet mine** is in 450 feet. It will only take about 300 feet more to reach the gravel, when Planet starts, if not contrary to all expectations, will take a sudden rise.

**The tunnel in the Steep Hollow company's mine** is already advanced 170 feet, and is going ahead at the rate of four feet per day.

### SIERRA.

**WATER.**—Mountain Messenger, Nov. 10: The Bald Mountain company have a little water for washing. It is believed that they can wash out money enough to avoid the necessity of issuing scrip. They had 102 men on the last payroll.

**ATTACHED.**—All the property owned by the Pioneer mining company at Grass Flat and vicinity, has been attached by the Bank of La Porte, and will be sold at Sheriff's sale in December.

**PREPARED.**—We are informed that the Pioche company is prepared for winter, and will commence sinking in about two weeks.

### TUOLUMNE.

**THE JONES & WOODMAN.**—Tuolumne Independent, Nov. 17: This mine, situated above Columbia, is being opened by a San Francisco company. New machinery is coming up from below, and it is proposed to put up sulphuric works, condensing, etc., to work the mine at the greatest profit possible. The mine is undoubtedly valuable, and we expect to hear good results as soon as everything is in working order.

## Nevada.

### WASHOE DISTRICT.

**COS. VIRGINIA.**—Gold Hill News, Nov. 21: Daily yield 600 tons of ore. The grade of the ore from all portions of the mine is fully up to the usual high standard, and notwithstanding the street stories about a reduction of the monthly dividends to \$1, the Consolidated will continue to pay her regular \$2 dividends for a long time yet to come. In fact the best judges we have of such matters cannot yet see or foresee any such thing. On the 1200-foot level the ore stopes continue to yield rich ore and to hold their full width. On the 1300-foot level the week has been spent mostly in necessary re-timbering and repairs to the drifts preparatory to opening up the ore bodies left in the southern portion of the mine. On the 1400-foot level the ore body is opening out beyond all expectation. On the 1500-foot level, enlarging the drift connecting the C. & C. and Con. Virginia shafts is going vigorously forward. The ore chutes being put in the south lateral drift on this level, to receive the ores from the 1400-foot level, are completed. The main shaft has been connected with the west drift on the 1650-foot level, and is now nearly ready to hoist ore from that portion of the mine. On the 1650-foot level the ore stopes going southward were never richer or looked better than at this time. The south branch of the main belt drift struck the ore vein last Saturday morning, showing it to be very rich and rapidly widening to the eastward at that point. The 20 additional stamps to the California battery mill were all started into full operation on Sunday last, and the returns for the month are already amply sufficient to insure the payment of the regular \$2 dividend for December.

**CALIFORNIA.**—Daily yield, 650 tons of ore. The ore stopes on the 1400-foot level are yielding their usual quota of rich ore, keeping the mills all busily employed in its reduction. On the 1550-foot level the breasts are showing well and yielding rich ore. The Consolidated shaft is finished to the 1650-foot level, nearly ready to commence the extraction of ore from that portion of the mine. On the 1600-foot level the ore stopes continue the usual yield of rich ore and show well at all points. The north lateral drift, driving to connect winze No. 5 and winze No. 6 is steadily advancing, the face still in good ore. On the 1750-foot level, enlarging and re-timbering the drift connecting with the C. & C. shaft is making rapid headway. The ore in crosscut No. 2 east on this level has shown a very great improvement during the past week. The main south drift on the 1340-foot level is making steady and favorable progress. The 20 additional stamps to the battery mill were started up last Sunday, and are now running steadily. This mill is now capable of reducing daily 425 tons of ore, ready for the amalgamating mills.

**SILVER HILL.**—The north drift on the 400-foot level is steadily advancing along the west wall of the ore vein toward the south line of the Justice at the rate of 6 feet per day. This drift has now but a very short distance to run to connect with the Justice. As soon as that connection is completed and ventilation obtained, crosscutting the ore vein will be commenced. Sinking the main incline shaft is going ahead at the rate of two feet per day, the bottom being in hard blasting rock, and the flow of water giving but little if any trouble.

**JULIA COS.**—The east crosscut from the termination of the main south drift on the 1300-foot level is being steadily advanced through quartz and ore of a fine character that anything that has been found in the mine on that level. The ledge appears to be again concentrating to the east and south of the explorations, and holds out a goodly promise that the long deferred hopes of the Julia stockholders will not prove in vain, and that they will yet be rewarded for their patience and perseverance.

**THE NORTH DUTCH FLAT.**—The pumps have never done more faithful and constant work since they were started than they have for the past week. Everything has worked splendidly and the water has been steadily receding until it is now four feet below the 2000-foot station. The shaft has been put in good repair to that point, and men are now at work doing a little necessary cleaning and repairing to the station. The timbers are all in place and the station is now open considering the length of time it has been submerged.

**YELLOW JACKET.**—On the 2200-foot level the main drift east toward the new shaft has passed through the very promising vein of quartz mentioned in last week's report, and is now in porphyry. Considerable water is met with. The drift north on this same level, running toward the Imperial, has nearly reached the north lode of the Jacket, and the face continues in quartz of a very favorable character.

**ALTA.**—Sinking the main shaft was suspended during the first part of the week to open the 1150-foot station. This is now well under way and a drift started west to cut the ledge, which is now in a distance of 15 feet. Sinking the shaft cannot be resumed until a new station for the pumps is started, which will be accomplished in five or six days more.

**LADY WASHINGTON.**—The shaft is thoroughly cleaned out and put in good condition for active work, and sinking will be resumed shortly. Very little water was found in it, owing to the Justice having assisted in the drainage.

**BULLION.**—The south drift on the 1700-foot level is being pushed rapidly ahead, the face in very favorable quartz of a low grade. Sinking the joint Exchangeer winze below this level, to connect with the north drift from the Imperial on the 2000-foot level, is going steadily ahead.

**OVERMAN.**—The east drift on the 1400-foot level is being pushed vigorously forward, the face in quartz and porphyry mixed. The face of the south drift on the same level is showing fine quartz and some excellent ore.

**WAKO.**—The main shaft was down by actual measurement yesterday 910 feet. The bottom is in a lively, easy-working porphyry. The flow of water is light and gives no trouble.

**SUCCESS.**—Driving the west drift at the 900-foot level is being pushed rapidly ahead to cut the ore vein. The rock in the face is of a good soft and easy grade.

**ORION.**—The face of the east drift on the 1900-foot level is 35 feet east of the ore vein recently encountered and is still in porphyry, carrying occasional streaks of quartz and clay. The drift has been stopped in order to lay track and put in a switch at the junction of the drift with the new ore discovery, preparatory to driving pros-

pecting drifts both north and south on the ore, to determine not only its width but also its character and tendency. So far as the vein has yet been penetrated it is of the most favorable character, and the best experts on the lode are more confirmed than ever in the belief that it will lead either north or south to a large and valuable ore deposit. The main south drift on the same level, which has been suspended for some time, was started up again day before yesterday, and is now being pushed energetically ahead. Cutting out for the incline pump-hub at the 1900-foot station is going rapidly ahead. Sinking the joint Ophir and Mexican winze on the north line is making about two and a half feet per day.

**UTAH.**—The south drift on the 1150-foot level was connected to-day with the upraise from the 1250-foot level of the Sierra Nevada, which, as soon as a little enlarging and cleaning-up is accomplished, will give a good ventilation and an opportunity to begin crosscutting the ore vein on that level.

**JUSTICE.**—Daily yield, 300 tons of ore, keeping the mills all steadily running. The ore vein on the 1000-foot level opening up much better than has been expected for some time past. The prospects now are that this will be the best level that has yet been opened in the mine.

**CHOWS POINT.**—Daily yield, 50 tons of ore, which is being extracted from the 100 and 230-foot levels. Prospecting drifts are still being run on each of these levels, with the expectation of still further valuable ore developments in these portions of the mine.

**SAVAGE.**—The pumps have been doing steady and splendid service during the past week until yesterday, when a little trouble was experienced with a section of the pump-rod. That has, however, been repaired and everything is again working as finely as usual. The water is now reduced to the 2000-foot level.

**NORTH COS.**—The pumps are running day and night and are rapidly draining the water. It is now reduced some distance below the 1150-foot station, and at the present rate of drainage the shaft will be perfectly dry by next Saturday.

**TRONAM.**—The ore stopes and breasts on the 240 and 350-foot levels are looking first-rate and yielding ore enough to keep the Nevada mill steadily running. There is plenty of ore in sight and more could be extracted if required by increased mining facilities.

**GOLD & CUREY.**—The north drift on the 1000-foot level is steadily advancing, the face still in hard blasting porphyry. This drift will reach the north line of the mine some time during the coming week.

**BALTIMORE AND AMERICAN FLAT.**—The northeast drift on the 1400-foot level is cleaned out to the west clay wall of the ledge and will in a very short time be in excellent working condition to the face.

**UNION COS.**—The face of the east crosscut on the 1300-foot level is in a fine character of vein matter and is being pushed steadily ahead.

**CHOLLAR POTEB.**—Daily yield, 35 tons of ore, which is being reduced at the mills as fast as it is extracted.

**THE 1400-foot level** is being cleaned out below the 1000-foot level is going steadily ahead with some very favorable ore indications. Sinking the drain shaft is also making good progress.

**SIERRA NEVADA.**—The connection between the north drift on the 1250-foot level and the south drift in the Utah on the 1150-foot level is completed.

**JOSEPHES AND GEORGE DOUGLASS.**—Considerable improvement has been met with at the bottom of the shaft, a better quality of quartz being cut into.

**SOCIETY COMBOK.**—During the past week 18 feet has been added to the south cross-drift on the 500-foot level, and it is substantially timbered.

**CON. IMPERIAL.**—Sinking the south winze below the 2250-foot level is going steadily ahead.

**1300 FT. TENSEL.**—Total length of tunnel last evening, 13,000 feet. The face of the tunnel continues in good working ledge matter and constant and secure timbering is required.

**NORTH DAYTON.**—Drifting in the ledge from the lower tunnel is actively progressing and some very fair assays are being obtained.

### ELY DISTRICT.

**RE-TIMBERING.**—Pioche Record, Nov. 17: Several wagon loads of two-inch lumber arrived here on Thursday last, it being a portion of the lumber to be used in re-timbering the shaft of the Meadow Valley mine.

**ALPS COMPANY.**—Work is continued as vigorous as usual and about the quantity of ore is coming from the Yerington stoop on the ninth level. The development on the 11th level continues to improve.

**PUMP AND ENGINE SOLO.**—We have it on the best authority that Mr. Taylor, the President of the Rison Iron Works of San Francisco, has sold the engine, pump, and what machinery is left in the foundry belonging to or owned by the Meadow Valley mine, to a mining company of Virginia City. The foundry company had become tired of the waiting process and closed on a good offer for the machinery, for which action we see nothing to condemn, as the Trustees of the Meadow Valley mine could not make up their minds what to do in regard to the pump. The pump of the Raymond & Ely mine can be made, by proper appliances, to drain also the Meadow Valley mine, so that if both companies made the proper arrangements the mines could be worked in common in regard to drainage with very little extra expensio from the cost of working the Raymond & Ely.

**RAYMOND AND ELY MINE.**—Still continue moving down on winze from 1200-foot level; working in comparatively dry ground. Ore continues to be taken out steadily from the upper levels in the usual quantities, no change in the character of the mine during the past week. The mine continues to run on ore and tailings and is doing well in the way of turning out bullion.

### MIAMI DISTRICT.

**LATEST DISCOVERIES.**—Pioche Record, Nov. 17: The latest discovery in the way of mines that we have heard of has been made in the above named district. Mr. S. R. Nichols, mining recorder of Miami district, and who was also mining recorder of Ely district in his palmy days, and the discoverer of the Pioche and several other mines in this district, brought several samples of ore from there the other day of claims in which he is interested, which yielded as follows: Lily May, \$235; Illinois, \$157; Black Bess, \$268. There were also several other assays made, one of which went high up into the hundreds.

## Arizona.

**ARNOLD.**—Arizona Enterprise, Nov. 12: The Arnold company, in Cedar valley, Mohave county, has a shaft down 60 feet, with a crosscut at the bottom. The ledge is 30 feet wide. They shipped recently to San Francisco 17 tons of ore, which assayed \$419 per ton. A mill will be erected on this mine shortly.

**The Tip-top company** has now 45 men at work, and a large quantity of rich ore is being taken out. The Black Jack, about 300 yards from the Tip-top, is showing up very rich.

**For the space of some seven or eight miles square in the immediate vicinity of the Tip-top and Crosscut leads, it would surprise the oldest man in the mountains to see the number of locations that show rich ore on the surface, ranging from \$300 to \$3,000 to the ton. It is true many of these rich leads are small, but they can generally be traced a long distance on the surface and some of them have improved in value and richness. Of course the rich ore mines are not all for prospecting purposes and as rich as any reasonable person could desire. Some of the principal mines have changed their ores as they go down from horn silver, chlorides and carbonate to black sulphurets and ruby silver, which are good indications for permanency. Altogether, from present appearances, the district will be "some" in the near future, and all mine owners here expect their financial troubles to end soon.**

## Idaho.

**FLORIDA MOUNTAIN.**—Owyhee Avalanche, Nov. 17: Much interest continues to be manifested in the operations at present in progress on Florida mountain. Hoist-



## THE ENGINEER.

## American and British Bridge Building.

In an address delivered at a late meeting of the Liverpool Engineering Society, by the President, C. Graham Smith, we find the following contrast: Bridges on the American system have a decided advantage in new countries on account of the small weight of the various portions and the speed with which they can be put together. It is no uncommon circumstance to find American engineers speaking and writing of putting up spans of 150 feet to 250 feet in from two to four days. According to Mr. Lovett, chief engineer to the Ohio and Mississippi railway, the last span of the Medora bridge built for that company over White river, and measuring 147 feet 6 inches between center and center of end piers, was erected by four foremen and 37 men in one day. In England a few weeks more or less for the erection of a bridge is not generally a matter of great moment, but for foreign work speed is often of paramount importance, as the streams which can be walked across dry-shod one day are in the space of 24 hours converted into roaring torrents capable of washing away both the temporary staging and the girders in course of erection upon it. Another advantage of speed in construction in foreign countries is the fact that the new road is often the only means of communication with its own more advanced portions, and until a certain bridge can be constructed it may be difficult to convey materials for the advancement of distant works. There is a further consideration which may even make it desirable to introduce this class of bridge into England, namely, that nearly the whole of the work in the construction is performed by machines, and the erection may be carried on by unskilled labor directed by competent foremen. These are matters worthy of some attention in these days of strikes and inconsiderate and arbitrary restrictions imposed upon labor by various unions. For instance the day's work of a boilermaker allowed by the boilermaker's club can be put in by 12 or one o'clock by a good average man working piece-work. This, of course, enhances the value of riveted work, and it therefore behooves engineers to reduce as much as they consistently can the number of rivets in their bridge designs.

**THE TUNNEL BENEATH THE BRITISH CHANNEL.**—The London *Daily News* says: Operations connected with the submarine tunnel have already been commenced; on the other side of the channel, several pits having been sunk to the depth of 110 yards. At the same time the French and English committees have definitely drawn up the conditions of working for the route. The property of the tunnel is to be divided in half by the length—that is to say, each company will possess half of the line, reckoning the distance from coast to coast at low tide. Each company will cover the expense of its portion. The general work of excavation will be done, on the one hand by the Great Northern of France, and on the other by the Chatham and Southeastern Companies, the two latter having each a direct route from London to Dover. All the materials of the French and English lines will pass through the tunnel in order to prevent unnecessary expense and delay of transshipment, as in England and in France railway companies use each other's lines, and goods can pass from one line to another without changing vans. It is understood that an arrangement will be established for a similar exchange of lines between all the English and continental railway companies when the tunnel is completed. The tunnel will belong to its founders. At the expiration of 30 years the two governments will be able to take possession of the tunnel upon certain conditions.

**UNION PACIFIC BRANCHES.**—General George Crook has been asked by one of the governing directors of the Union Pacific railroad to give his opinion in regard to the construction of two branches from the main line of that road, one from a point east of Sherman, Wyoming, to Roseman, Montana, and the other from Rawlins, Wyoming, to the eastern branch at its terminus in Montana, the eastern branch to pass through the Black Hills, and the western through the Wind river country. The General makes a reply, under date of October 9th, 1877, of which the following paragraph contains the most important passages: "They will have a most salutary and positive effect in settling our Indian troubles, thereby saving large expenditures of public funds. They will invite to and open up for settlement most valuable farming and grazing lands, aid in the discovery of new mining sections, and promote the development of valuable mineral resources already discovered. They will save the public treasury vast amounts in economy of transportation of military supplies, of troops, and mails. From my personal knowledge of the country through which the proposed lines will pass, I regard the project as eminently practicable, and more easily accomplished than many of the works of similar character now in successful operation in the country west of the Mississippi.

**CANADIAN PACIFIC.**—All the Canadian Pacific railway survey parties east of the Rocky mountains have closed operations for the season, and most of them have returned to the capital. Parties employed in British Columbia will cease work immediately and return to headquarters.

## A Plea for Universal Time.

The interest of those who own railroads and steamboats, as well as the interest of the people, requires that they all be run in unison with system and regularity. A writer for the *Railroad Gazette* says: One of the great inconveniences attending an arrangement of this kind is the want of a common, or, as we shall term it, universal time. It will not be necessary for us to refer to any particular place, where perhaps trains come and go by New York, Pittsburgh, Cincinnati, Chicago and local time; the traveling community are well aware of these annoyances, as are also those whose duty it is to make up a time table that shall connect their roads advantageously with others.

And oftentimes when we see a cablegram in the papers, from some foreign country, after considering the dates and figuring on the time elapsed from time of sending to time of receiving, we are not sure but we may be out 24 hours one way or the other.

To obviate these difficulties we will offer the following suggestions: Establish a prime meridian to pass through Bebring's strait, and let the day by local time commence at this line, and also the day universal, but 12 hours later, or when the sun is on this line, the hours of the day universal to number from 0 to 24; and also let longitude be reckoned from this line, numbering from 0 westerly around the globe to 360°, the universal time to be given daily by telegraph to the principal cities throughout the Union by the astronomer at Washington. All schedule time of railroads and steamboats and ocean steamers, as well as official documents and telegrams should be made out in universal

## The Trans-Andine Railway.

The prospect for a railway over the Andes in South America is creating no little interest in England. Some authorities seem to believe that when this work is complete there will be no farther use for our overland roads so far as through traffic between England and Oceania is concerned. Iron thus expresses itself: "Any one referring to the map of South America, and knowing that there is a railway in operation to Rio Quinto, which is nearer to the Andes than the Atlantic, and that the Valparaíso railway has for many years returned a net profit of more than 10% on its traffic between that port and the town of Santa Rosa, at the very foot of the Andes, will appreciate the importance of the proposed railway, as it will unite both lines. We do not anticipate any goods traffic between the Atlantic and the Pacific, nor has this ever been asserted by the concessionaires; but we feel certain that it will promote a very considerable goods traffic between the intermediate stations and the coast on either side. Moreover, the inter-oceanic communication will certainly attract the whole passenger traffic, not only of the Pacific coast, but possibly that from Australia." Thus it appears that even San Franciscans must go to New York via South America. Indeed!

## Prizes for Gas Engineers.

We notice that the Society of the gas industry in France has offered five prizes for 1878, which are as follows:

1. A prize of 2,000 francs (\$400) to the author of the best paper upon economical heating



BOTTLE TREE OF AUSTRALIA.

time. The local publication of time tables for railroads and steamboats, however, should also be made out in local time.

**ASIATIC RAILROADS.**—According to the journal of the Imperial Society of Geography of Vienna, M. Hochstan, President of the society, has recently published a pamphlet on the different projects studied for the establishment of a railroad through Central Asia and China. The following are the four principal routes: 1. The Baranowski project. Saratoff is the proposed point of departure. From here through the country of the Kirghises and over the Hindoo-Koosh mountains. This is the road of greatest travel to Moscow and Peshawur, the principal fortresses of the valley of the Indus. 2. The Lessep-Cotard project. From Orenbourg to Peshawur by Oursk, Taschkend, Samarkand and Balk. 3. The Bogdanowitch project, the principal points of stoppage being Moscow, Kanzan, Ekatherinobourg, Oursk, Tomsk, Irkutsk and Pekin. 4. The Ruthhofen project. This would be along the Siberian route to Oursk, passing Taschkend, Samarkand and Balk. At this point the road leads toward the west, and passes Teheran, and rejoins at Tiflis the Russian roads of the Caucasus, now in process of construction.

**ITALIAN RAILWAYS.**—Considering the state of its finances, the Italian government is courageous in its desire to buy off the three chief companies which now have railways in their hands—the Alta Italia, Romane and Meridionali—and either work them itself on behalf of the State, or farm them out like the tobacco monopoly. There is great merit in State purchase or State resumption of railways if done at the proper time, that is to say, before the dividends have become so large as to encourage unholly greed in shareholders. At present the Italian lines pay an average of a little more than two per cent., and their proprietors would probably prove tractable enough.

of benches by either solid, liquid or gaseous fuel.

2. A prize of 1,000 francs (\$200) to the author of the best paper upon arrangement of pipes, and the means of discovering leaks and repairing them.

3. A prize of 1,000 francs (\$200) to the author of the best paper upon exhausting gas in general, and the apparatus employed for this purpose.

4. A prize of 1,200 francs (\$240) to be divided between the authors of the two best papers presented to the Congress, upon any other subjects than the three preceding.

5. A prize of 200 francs (\$40) to the foreman or workman having the longest and best service in one gas works.

The papers must be written in French, and must be sent to the president of the committee before the 1st of May, 1878.

Any one, whether French or foreigner, member of the Society or not, can compete.

## A Curious Australian Tree.

The "bottle tree" is an Australian tree of the family *Stereuliaceae*. It has the calyx five-cleft, usually colored; no petals; column of stamens with 15 or rarely 10 anthers; stigma peltate, carpels five distinct, with two or more ovules, narrow digitate leaves; paniculate auxiliary inflorescence; flowers unisexual or polygamous, the female flowers expanding first.

The tree has a greatly expanded trunk which is swollen to a disproportionate size. Where the ground is rocky this expansion is greatest just below the branches, but in favorable soils the foot of the tree is largest, forming a uniform cylindrical column from whose summits the branches issue as from the neck of a bottle.

The family of which the bottle tree is a member, embraces many trees valuable for their wood and for their nutritious seeds, the most famous of which is *Cacao*, from which chocolate is derived.

## The River Mining Machines.

Several months ago we gave an account of a new kind of mining machine that was being built on the Feather river for the purpose of mining in the bed of the river. Several times have we been written to regarding it. The anxious question seemed to be, "Will it pay?" We have not answered the question yet, nor do we intend to in this article further than to say that it has not done so up to this time, but on the contrary, has been a very heavy bill of expense to those who have anything to do with it. Mr. J. M. Burt, President of the Main Feather River company, informs us that the one his company built cost over \$10,000, and although the company has been operating it for weeks, it has not succeeded in taking out any gold. As fast as a hole was dug in the river bed it would almost immediately fill up, by the water running tailings and debris into it. The boat will be dismantled this week and taken below the bridge, and either laid up for good or else put to work on the lava beds. The company have lost all faith in it, and do not care to invest more money in such enterprises. No doubt if they were able to find a place where the gold was thickly sprinkled through the earth, and it was covered with water, one of these machines might be of good service in extracting it. There is still another boat or machine higher up the river, operated by the California mining and dredging company, with little or no better success than the one referred to.—*Oroville Mercury*.

It is pretty certain that if these machines did not work satisfactorily this year, after a dry season, when the rivers were lower than they have been for several years, they will never work at all. There was always considerable doubt in the minds of many mining men as to the practicability of these machines, but when those directly interested saw them at work and then invested their money in them, it seemed a great point in their favor. It always looked somewhat chimerical to attempt to go through a mass of debris and tailings with this kind of a machine to get at the bottom of the river, when there was water enough to float the boat over these tailings. The general impression was that the tailings themselves would pay for working in this way, but they would have to be worked on a very much larger scale than by such machines to do this. No doubt if the machines had struck rich spots in the river they could have been made profitable, but the difficulty was to find the locality of these spots and then to get down to the bottom for the gold. The machines have not been successful in doing either, and with the advent of high water in the river they will probably be laid up for good.

## The Destructive Locust of California.

It may be interesting to know that the California grasshopper is a species distinct from that which brings devastation to our prairie brethren, although it does not appear that it is at all deficient in the quality of appetite which is characteristic of the locust family. Indeed our California pest, although it does not come in cohorts sufficiently large to crush us, as the Rocky mountain locust does the prairie farmers, it still has a persistent hunger which leads Prof. Packard to call it *Eutypoda Atrax* or the "terrible grasshopper." In a very valuable report just made by Prof. Packard to Prof. Hayden's Survey, the author gives our California insect a careful review and states some facts of general interest. He says: "To the best of my knowledge, it is the only species of the genus which has anywhere proved seriously and persistently injurious to crops. Several species of the closely allied genus *Pachytylus* have ravaged the fields of Eastern Europe and Asia; and it is interesting in a zoological point of view, to find that California, whose insect fauna bears a much more general resemblance to the peculiar types of the Old World than to those characteristic of the opposite border of the New World, should in this case also harbor a devastating grasshopper so much more nearly allied to the destructive species of the Mediterranean than to those found upon the same continent with itself."

Prof. Packard gives a summary of the facts noted by our local entomologists and by those who have visited our State. Mr. Henry Edwards writes to him as follows: "This species is very abundant in the spring and early summer but at present (1876) appears to be somewhat limited in its range as far as California is concerned. It is found only in our foothills, and has not, to my knowledge at least, been regarded as a very destructive insect. I never saw it but once in very large swarms, and it then appeared to attach itself more to the pasture grasses than to any growing crops; although there were plenty of fields of barley, oats, etc., in the neighborhood. It appears in its larval condition in April, and in the winged state in May, passing entirely out of existence by the middle of June. I have taken it sparingly in Nevada and in Vancouver's island, and have seen some specimens from Santa Rosa island, but I am pretty sure that it cannot be called a common insect in those localities."

The bullion from the Grand Prize mine, which has hitherto been shipped to San Francisco via Elko, now goes by way of Battle Mountain.



## Cinchonas.

As the formerly noted shortage in the supply of quinine material is growing more apparent, and the doctors do not all meet favorable results from experiments with the proposed substitution of other alkaloids, the price of quinine continues very high. This of course serves as a stimulus to attempts to grow the cinchonas in different countries which have a tropical or semi-tropical climate. It appears from our latest advices from the Agricultural Department at Washington that California now holds the forlorn hope of the United States in the successful growth of this tree within its borders. Even in California there seems hope only in our southernmost county, San Diego. William Saunders, the well known superintendent of the gardens of the department, arrives at this conclusion, from his efforts to introduce cinchona, and if any of our friends in San Diego desire to test the growth, we would advise them to address the Commissioner of Agriculture concerning it. Mr. Saunders furnishes the following interesting information on this subject:

"During the past ten years a continuous supply of young plants of several species of cinchona has been maintained by a yearly propagation of young plants equal to the numbers distributed. Plants have been sent to California, and to several of the Southern States, mainly to Florida. The reports that have reached the department do not indicate success in their culture, owing to adverse climatic influences. Experiments here show that none of the species will stand the slightest frost without injury, and even in the equable atmosphere of the greenhouse their vitality is impaired when the temperature is below 50°. Whether or not the climatic conditions for the growth of cinchonas exist in any portion of the country is a question not yet solved, but, so far as our present knowledge warrants an opinion, further experiments should be confined to the locality of San Diego, Cal., as offering greater promise of success than any other point.

"In the recently-formed cinchona plantations in India the best results are said to be obtained in a warm, equable and very moist atmosphere, at elevations where the mean yearly temperature indicates 64°; and in those established in St. Helena, the plants flourish well at an elevation of 1,500 feet above the sea level, in rich lands, bathed in moisture, the mean temperature for the year being 60°.

"Dr. J. E. Howard, of England (high authority in everything relating to the cinchona), in the transactions of the Linnean Society, remarks that 'it must be remembered that these are mountain plants, loving free air and alternate mist and sunshine, while the hot, close atmosphere of the lower valleys is always injurious to their perfection as quinine-producing plants.' It is shown in the reports of the Signal Office that the mean temperature for the year at San Diego is 60°, the highest monthly mean reaching 68° in August, and the lowest monthly mean being that of 53° in January and February. So far as thermometric figures indicate atmospheric temperature, the climate of San Diego corresponds with that of St. Helena, but it is well known that the thermometer alone is not a safe guide in comparisons of this kind; the hygrometrical condition of the atmosphere being of equal, if not of greater, importance as regards vegetable growth. Experience in the culture of several species here confirm the reports that *Cinchona succirubra* is the most robust in growth. This species predominates in artificial plantations on account of its rapid growth."

## Potash in California Marsh Plants.

We learn from the last report of the Department of Agriculture at Washington, that Mr. McMurtrie, the chemist, has been examining some California marsh plants which have been proposed as a source of potash. His conclusions are not favorable to their profitable use in the way proposed, but we find a note or two worth putting on record concerning the composition of the plants. He made an analysis of *Mesembryanthemum Crystallinum* a plant belonging to the natural order *Ficoides*, which is found growing extensively in tide marshes in the vicinity of San Diego. This plant has been used in some sections for food and on the Canary islands it has been burned for the ashes, which it was believed, contained a high proportion of potash. On this account the ashes were shipped to Spain and sold to the glass manufacturers. Mr. McMurtrie remarks that as a food the plant is always used in a young, green state, and necessarily so, for his analysis of the mature plant showed the presence of about 13% of oxalic acid. The analysis also showed 5% of potash and 10% of soda in the air-dried plant. These alkalies, the chemist concludes, from other facts brought out by the analysis, are probably combined with oxalic and phosphoric acids and chlorine.

Another analysis is of the plant *Suaeda Californica*, which grows extensively in our salt marshes and belongs to the natural order *Chenopodiaceae*. It was proposed as a source of potash, but the conclusion is that it shows no superior value in this direction as it contains but about 2½% of potash.

## USEFUL INFORMATION.

## Deposition of Copper by Electricity.

At the American Institute of Engineers' meeting, lately, as reported by the *Iron Age*, Mr. N. S. Keith, of New York, read a very interesting paper on the above subject. The object sought to be accomplished was the obtaining of copper from the mother liquor of a copper sulphate manufactory, the liquors being the result of several solutions of commercial scrap copper containing impurities, the quantity of which in the liquors had increased by the operations until too large to allow the formation of pure, or even merchantable copper sulphate. There were silver, nickel, tin, zinc, antimony and iron sulphates in solution, besides enough copper sulphate to represent 4½% of the total weight of solution as metallic copper. The question was to obtain this copper in a cheap, practical and expeditious way by the agency of electricity. Experiments and computations showed that many of the different cells, such as Daniell's, Brunsen's, Grove's and the gravity battery were too expensive in use. This was the same with dynamo-electric machines, though the cost was much less. Iron, when used in the well-known way, gives copper deposited in a powder, mixed with insoluble basic salts of iron. These considerations led to the abandonment of the idea of using these for the purpose designed.

By a plan which he put into use, iron was placed in less than a saturated solution of sulphate of iron (free from copper) contained in an ordinary porous cell such as is used in various galvanic batteries. The porous cell and contents were placed in a larger vessel containing some of the copper liquor and a sheet of metallic copper. The iron and copper were connected externally to the solution by means of a clamp. In 36 hours the liquor was completely freed from copper, which was deposited upon the copper sheet as a beautiful velvet-like coat, pure, reguline and coherent. Occasional displacements by water of the nearly saturated solution of sulphate of iron formed in the porous cell were made. No formation of basic salts of iron; no copper powder; none of the defects of the ordinary precipitation of copper by means of iron. By means of enlargements and modifications of this simple mode of treatment, any amount of copper solutions may be made to produce fine merchantable copper by inexpensive apparatus at, say, one cent per pound of copper more or less, as scrap iron (which may be placed loosely in the porous vessels) may be worth more or less than \$20 per ton.

## Detecting Shoddy with the Microscope.

We find in the *Manufacturer and Builder* an article by Dr. Adolph Ott, giving a summary of the results gained by Dr. Robert Schlesinger in the detection of shoddy with the microscope. We quote as follows: "If the prepared shoddy is exposed to a magnifying power of 100 or 150, the scaly woolen hair will be seen by the side of the smooth silk thread, or the thick-walled linen thread, or the spiral-formed cotton. The color of these fibers varies generally very much, so that the object gives a very variegated image. After being thus persuaded of the presence of the various fibers, a drop of cupro-ammonia may be added for the sake of confirmation. This destroys silk and cotton rapidly, attacks then the linen and produces at last a swelling of the wool. If to another specimen sulphuric acid is added, the wool is dissolved and forms a red solution."

"After it has thus been determined of what fibers the shoddy consists, the wool must be more closely examined, that is, it is to be determined whether it consists completely or only partly of used hair. To this end, it is first necessary to compare with each other the color, structure and the chemical deportment of the two kinds. With regard to the color the difference is really great. In most shoddy there occurs colored and uncolored wool threads; the latter appear either perfectly white or they exhibit distinct traces of former color removed by bleaching. In the better kinds the colored hairs are only of one color; in the inferior sorts several colors are generally represented. This alone is a strong proof that the threads have not been subjected to one common dyeing operation, but that their peculiar color is the product of a process which they have received formerly in a tissue of their own. All this is not discernible to the unaided eye. Another chief point of difference between the two kinds is to be found in their diameter; the hair of shoddy wool is never regularly formed and lacks the constant diameter of new wool; it grows smaller either gradually or abruptly and grows wider in a deformed manner, in order to contract itself again or to assume a regular form for only a short distance. At some spots it is devoid of scales, at others it is torn, whereby the diameter sinks often below its ordinary measure, and a width of 0.01 millimeter or 0.0003 inch is not rare."

"By the microscope shoddy may be examined quantitatively as follows: Some specimens are prepared with the greatest possible care, whereby the precaution ought to be taken that the single fibers cross each other as little as possible but lie parallel to one another. They are thus ex-

posed to a magnifying power of 20 or 30 times, so that the observer may be able to glance at a large portion at once. He has to note now how many fibers there are of each kind; the numbers furnish the approximative proportions in which the several fibers have been mixed with each other."

**ADULTERATION IN SEEDS.**—The careful and exhaustive examinations of seed grain carried on by Dr. Friedrich Nobbe, at Tharand, as cited by the *London Farmer*, tend to show that it is but too commonly adulterated and tampered with to a far greater extent than is generally supposed. He has succeeded in proving beyond dispute that many parcels of clover and lucerne are systematically mixed with quartz, artificially prepared and colored for the purpose, at specially constructed manufactories. So cleverly are these stony impostures turned out, that it is difficult even for a practiced eye to detect the deception. The frequency with which old seeds are colored, faced, oiled and polished, so as to give them a laudable appearance in the market, is beyond belief even in these days of "commercial morality." The admixture of untreated old seeds, no longer capable of germination, is a comparatively innocent form of swindle as compared with the modern refinements of rascality. The absolutely worthless material in many samples examined at Tharand amounted to 50 per cent. of the whole bulk. Amongst other specimens of the ingenious fraud, it is stated that the seed of the so-called American lucerne (*Medicago maculata*) is adulterated with the dressings of American and East Indian wools, these fleeces containing large quantities of the seeds of the Australian thistle, which are almost undistinguishable from lucerne seed. Hundreds of sacks of this thistle seed are annually imported into Germany for the purposes of adulteration. At the bottom of all this, of course, are the hankerings for "cheap" goods, and the stupidity which will not recognize the fact that the payment of a fair price to a fair-dealing merchant is the surest means of getting value for their money.

## GOOD HEALTH.

## The Hygiene of the Hair.

Prof. Erasmus Wilson, who is probably the highest living authority on the subject, has lately given a course of lectures on the hair before the College of Surgeons in London. They are reported in full in some of the English medical magazines, and an abstract of the more practical portions is given in the *Journal of Chemistry*. Cleanliness is, of course, insisted upon as of prime importance, but washing the hair is emphatically condemned. Brushing is to be preferred, as it promotes circulation, removes scurf, and is in all respects a more effective stimulant than water. Cutting does not encourage growth as much as is commonly believed, but is advantageous in the case of the short, slender hairs generally called "young hairs."

Of the countless applications recommended for the cure of baldness, few are ever successful, and in the occasional instances in which they appear to be useful it is possible that sequence is mistaken for consequence, the *post hoc* for the *propter hoc*. Most of these specifics are stimulants, not excepting petroleum, which has lately been eulogized.

Ammonia is Prof. Wilson's favorite stimulant; it is unlikely to create inflammation and its consequences; it is neither absorbable into the system, nor could it do harm if such were the case; and its odor, refreshing at the moment of its use, speedily evaporates. In a case of ordinary *madecia* or falling out of the hair, he prescribes a lotion composed of strong liquor ammonia, almond oil and chloroform, of each one part, diluted with five parts of alcohol or spirits of rosemary, and made fragrant by the addition of a drachm of the essential oil of lemons. The lotion should be dabbed upon the skin of the head after thorough friction with the hairbrush. It may be diluted if necessary; it may be applied sparingly or abundantly; and it may be used daily or otherwise.

There are cases in which a less stimulating and even a refrigerating lotion may be desired, and where an objection may be raised to the quantity of oil contained in the above. In such cases a lotion of horax and glycerine, two drachms of each to eight ounces of distilled water, is cooling and refreshing; this lotion allays dryness of the skin, removes scurf, and subdues irritability.

In cases of complete baldness, and also in *alopecia areata*, a stronger stimulant application will be required. For this he recommends frictions with a liniment composed of equal parts of the liniments of camphor, ammonia, chloroform, and aconite, to be well rubbed into the bare places daily, or even twice a day, so as to produce a moderate amount of stimulation. In cases of *ophiasis*, due to neuralgia of the cutaneous nerves of the scalp, this liniment is very valuable. In other cases the liniment of iodine may be painted on the bare patches daily, or they may be rubbed with the ointment of caustics or any other powerful stimulant. The intent on all these local remedies is to stimulate without setting up irritation; to increase the energy of circulation and innervation of the part; and in some instances to abstract the excess of fluids from the tissues of the skin by inducing exudation. But these results must be

accomplished as far as possible without pain and without severity.

The constitutional treatment of *alopecia* should consist in the adjustment and regulation of the functions of digestion and assimilation; and, where no other special conditions are to be fulfilled, the adoption of a tonic regimen and the administration of tonic remedies. Of these last arsenic bears the palm, and may be advantageously prescribed in doses of two to four minims three times a day directly after food, and in any convenient vehicle.

Grayness, *canities* or *poliothria* depends like baldness on defective powers of the skin, and the indications for treatment are exactly the same—to strengthen the part and at the same time strengthen the patient.

## A Healthful Food.

*Hall's Journal of Health* says: That macaroni is an article of food which it should like to see in more common use in this country. When people learn to make it, as well as they make it in Naples; and what is equally important to cook it as the Neapolitans do, it will be as much used here as it is there, for it is, or might be, cheap and healthful.

The flour is specially ground for it, and the best article of macaroni is retailed in the Neapolitan provinces for five and six cents a pound. A commoner and coarser article is much used by the common people, which sells for about half this price. It is difficult to imagine what the *basse gente*, the lower classes, would do without macaroni.

Here, we think, it is usually baked with cheese; a style in which no Italian could be induced to eat it. They regard baked cheese as very indigestible. They boil their macaroni until it is tender, which ordinarily requires about 10 minutes and then serve it up with butter or the sauce of the ragout. To make this dish they take a piece of beef without bone, and after cutting an onion into small pieces and cooking it thoroughly in a kettle, they place the meat on the onion, and after it is partially cooked they add tomatoes, prepared as they would be for stewing, adding more from time to time and sometimes water and cooking for three or four hours. The meat is then served up by itself and the tomato sauce is poured over the macaroni. They always have some grated cheese on the table to be sprinkled on the macaroni by those who like it.

Twice a week, Sundays and Thursdays the year round, this forms the dinner for four-fifths of a population of 8,000,000 people. It is both healthful and inexpensive.

**THE SANITARY USE OF TREES.**—A correspondent of the *American Architect* calls attention to a phenomenon which he has observed in the outflow of waste from his own house. He has a close-built brick cesspool eight feet in diameter and eight feet deep, with an overflow thence for liquids into a percolating stone cesspool 10x10 feet; both are domed over at the top, closed each with a flat stone, and covered with soil. Unlike his neighbors, whose cesspools are constructed in the same manner and in the same kind of soil, but who are subjected to the necessity of cleaning out both cesspools at frequent intervals, his own have been in use for four years without being opened, and have given him no inconvenience. A few months ago a deep excavation in the street near his percolating or overflow cesspool revealed the fact that the moisture from it was all absorbed by the roots of three large and very flourishing trees, a tulip and two maples, in its immediate neighborhood. "There could be no accumulation of water," he says, "where there were such channels to draw it up." This certainly is an important point to be considered in locating the area of absorption for household waste. We do not remember to have seen elsewhere noticed this very probable sanitary function of trees; but if the theory is correct, it goes far to solve the most serious difficulty in the problem of drainage without common sewers.

**TO STOP NOSE-BLEED.**—A correspondent of the *Druggist's Advertiser* says: The bleeding may arise from an impoverished state of the blood, or it may be the symptom of some other disease. If the attack gives rise to serious apprehensions seek the advice of a physician. At times simple remedies relieve great ills, and perhaps a knowledge of the following simple remedies might prove serviceable: Bleeding may be stopped by raising the arms above the head. Sponging with ice-water the forehead and face. Applying a towel wet with cold water between the shoulders. Application of a strong solution of alum to the inside of the nostrils, or plugging the nostrils with lint or cotton wool soaked in this solution. Placing a small roll of paper or muslin under the upper lip, above the front teeth, and pressing firmly on the same, which by compressing the arteries, checks bleeding.

**SUNSHINE.**—Seclusion from sunshine is one of the misfortunes of our civilized life. Potato vines grown in a cellar are white and sickly, and so are girls grown in a parlor. Expose either to much sunshine and they begin to show color, health and strength. During those dreadful years, '49 and '51, I saw at least five cases of cholera on the shady side of the street to one on the sunny side. This was in Buffalo, N. Y. An eminent physician reports from his practice in New Orleans eight cases of yellow fever on the shaded side of the street to one on the sunny side.—DIO LEWIS.



# MINING SCIENTIFIC PRESS.

W. B. EWER, SENIOR EDITOR.

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SAN FRANCISCO:

Saturday Morning, Nov. 24, 1877.

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## The Week.

News of increasing activity in mining matters comes to us from all directions, more particularly, however, from the gravel mining regions of California. The ground is now pretty thoroughly saturated, and the water commencing to flow at a lively rate. The quartz mines are all doing well also. The bullion product of the principal quartz mines for October aggregated \$4,579,000. Arizona comes to the front for the first time this week in the San Francisco market, with a fifty cent dividend from the Silver King mine, recently listed on the stock board here. This, we hope, is but the first of many dividends from that country where so much rich ore is found on the surface, and the ledges commence paying from the grass roots. From the Comstock comes the cheering news that they have at last succeeded in getting the water in the Savage 18 inches below the 2,000-foot level, and three feet lower than that in the Hale & Norcross. The water has stayed at the 1900-foot level so many months, notwithstanding all exertions, that it looked as if they would never get ahead of it again. The deepest point attained in the Savage is some 200 feet lower than the 2200-foot level, while in the Hale & Norcross it is about 100 feet lower. But all the water below the last named level is dead, the mines having been flooded by water which broke into the north drift on the 2200-foot level of the Savage. The latest news from Ophir is that the whole face of the 1900-foot lateral drift, south of cross cut, is in ore assaying over \$90 per ton. It is to be hoped another bonanza will be developed, but there are so many stories it is hard to believe any of them.

## The Mining Laws.

### Points of Interest to Miners.

We have received from a subscriber in Nevada a letter asking a number of questions relating to the mining laws; the answers to which he says will be of great interest to many miners in his locality and probably elsewhere. We append the questions, and have answered them as we understand the matter after a close examination of the U. S. mining laws and various decisions of the Commissioner of the General Land Office and Secretary of the Interior. It is as well to premise, however, that many questions are still open, and it will necessitate a legal controversy to have them settled definitely by the courts. Until they are so settled they are open to discussion, and different men will differ in opinion concerning them. We do not profess to be infallible in legal matters, but have answered the questions propounded to the best of our ability after an examination of the laws:

I. In locating a claim in any district in the State of Nevada, where there is a District Recorder, must the claim be first recorded in the office of the District Recorder, or will it hold if it is only recorded in the County Recorder's office? Record of location notices, in the absence of a District Recorder, should be made with the proper Recorder of Deeds for the county wherein the claim is situated. The instructions of the Commissioner of the General Land Office say that within a reasonable time, say 20 days after the location shall have been marked on the ground, notice thereof, accurately describing the claim, should be filed for record with the proper Recorder of the district, who will thereupon issue the usual certificate of location. The only reasonable construction of this language is that the record must be made with the proper Recorder of the district, who is, of course, the District Recorder. In case there is no such officer, then the location may be recorded with the County Recorder. It has also been decided that, in the event of a mining claim being situated outside of any regularly constituted mining district, recording can be dispensed with. In this case, an affidavit of the fact should be made, and secondary evidence of possessory right will be received, which may consist of the affidavit of the claimant, supported by those of any other parties cognizant of the facts relative to the location, occupation and possession of such claim, and any deeds, certificates of location or purchase, or other evidence which may be in the claimant's possession or tend to establish his claim.

II. If two different parties locate the same claim and record it, one in the district office and the other in the county office, which is valid? Probably the one is valid that is recorded in the district office.

III. If both are valid, does priority of location carry the title? This question is answered in the previous one.

IV. Which date determines priority; is it the date of the notice or the date on which the notice is filed? There is no doubt whatever that the date of the location notice decides priority of ownership, and not the date of filing the notice with the Recorder. In the instructions of the Commissioner of the General Land Office, relative to the manner of locating claims on veins subsequent to May 10th, 1872, in speaking of the necessity of finding the vein within the limits of the claim located, the following paragraph appears: "The claimant should, therefore, prior to recording his claim, unless the vein can be traced in the surface, sink a shaft or run a tunnel or drift to a sufficient depth therein, to discover and develop a mineral-bearing vein lode or crevice; should determine, if possible, the general course of such vein in either direction from the point of discovery by which direction he will be governed in marking the boundaries of his claim on the surface, and should give the course and distance as nearly as practicable from the discovery shaft on the claim, to some permanent well known points or objects, such, for instance, as stone monuments, blazed trees, the confluence of streams, points of intersection of well known gulches, ravines or roads, prominent buttes, hills, etc., which may be in the immediate vicinity, and which will serve to perpetuate and fix the locus of the claim and render it susceptible of identification from the description thereof given in the record of locations of the district." Then, within a "reasonable time," the notice must be filed for record. The location notice must, therefore, decide the priority of titles, not the date of filing; for if it were otherwise there would be endless trouble by persons entering fraudulent notices for record, while the real owner was at work developing his claim; and if the record notice indicated priority, these men would have the best of it.

V. If a ledge should have appeared on the surface in several places, that is with stringers or feeders running out from it, does the law give the lode at the point of junction to the older location, or to the one located on what is the main ledge? Section 2,336 of the Revised Statutes reads: "Where two or more veins intersect across each other, priority of title shall govern, and such prior location shall be entitled to all ore or mineral contained within the space of the intersection; but the subsequent location shall have the right of way through the space of intersection for the purpose of the convenient working of the mine. And where two or more veins unite, the oldest or prior location shall take the vein below the point of union, including all the space of intersection."

"Weeks on Mineral Lands" takes the ground that the construction which has been given to this part of the law is that a party has a right to a patent for the number of feet along his lode or vein to which he has the local title, upon full compliance with the law and instructions; provided, however, that where another lode crosses, the one at the space of intersection belongs to the one who owns the prior location of the two, whether patented first or second. Of course until two lodes have been developed it cannot be ascertained with certainty that they are one and the same. If the same, the law provides which has the better right as stated; but it has been customary for the burden of proof to rest with the original locator. For instance, if A takes up a claim which B, the original locator, thinks is a stringer from his claim, it rests with B to prove that A is trespassing on his property; and A can work the ground until, by following up the lead, B proves it is part of his vein. The bare possibility that two lodes which are separate and distinct on the surface, may subsequently converge so as to form, at some indefinite distance underground, one and the same lode, is not sufficient basis for an adverse claim, nor for a protest against the issuance of a patent. It would not be expedient, says the Secretary of the Interior, to carry any such vague and undeterminable question as this into the courts, for the reason that until sufficient exploration and development have been made to establish the fact that the lodes unite and are identical, the judgment in view of the developments of one day, might be reversed by the same tribunal, by other developments, the next. Such a construction of the law would suspend the disposal of mineral lands until the attempted adjustment of hypothetical controversies. Besides, under the law, if lodes are found to unite (the question of size of either lode not being entertained), the parties who have the prior location and a patent are as fully invested with title to the lode beyond the point of union, including all the space of intersection, as if the other claim had not been patented.

In commenting on Section 2,336, it has been remarked that it appears to be plain, but when applied to the facts in mining cases, and when compared with a section giving all the veins within his lines to the locator, and especially when involved with different degrees of title (patented against possessory), or to the case of several overlapping patents, it may be found ambiguous. In Morrison's "Mining Rights in Colorado," it is sensibly stated that "The leading idea of the act is, that a lode is a straight vein whose course can be readily ascertained and indicated by a straight line or a series of straight lines, and that occasionally such a vein is crossed by another in a similar straight line, merely requiring the right of way to give each lode its proper claim; but, in fact, a lode is scarcely ever a straight line, and is seldom to be traced without confusion for more than a few feet, and in its course other veins are absorbed into, and offshoots, not only spurs, but perhaps better developed veins than itself run from it in all tortuous directions; and in its extension downwards, it invariably dips laterally and often shows a fork, of which both parts approach the surface; and it will divide, and may or may not unite at another point; and it will about suddenly upon country rock, and so be thrown far to one side; and, instead of showing distinct lines, mineral veins are as irregular, as disproportioned in length and width, as uncertain to segregate from each other as are the skins of the hand or veins in a block of marble. It is as the result of these natural facts that the same lode is so often claimed at various openings by as many sets of claimants, by equally honest and valid or invalid locations. If this irregularity were admitted in one case, the remedy would be obvious, but the practical difficulty consists in compelling such admission; the question whether two claims are upon the same or separate veins, or whether there is a junction or crossing, is always a disputed fact upon which parties will stand and witnesses will disagree."

VI. Does the United States patent issue to the original locator; and if so, does a quit claim deed, vest the right and title to the claim in the holder of said deed without transfer? The United States patent does not necessarily issue to the original locator, but to the real owner of the mine. Patents are issued to the parties named in the Register's certificate of entry. In applying for a patent the claimant must swear that he has the possessory right to the premises described, "in virtue of a compliance by himself (and by his grantors, if he claims by purchase), with the mining rules and regulations of the district in which the claim lies and with the mining laws of Congress." The affidavit should be supported by appropriate evidence as to possessory right, viz.: "Where he claims to be a locator, a full, true and correct description of such location should be furnished, as it appears on the mining records," etc. Where the applicant "claims only as a purchaser for valuable consideration, a copy of the location record must be filed, under seal or oath, with an abstract of title certified by the proper Recorder, tracing the right of possession by a continuous chain of conveyance from the original locator to the applicant." As far as the Government is concerned it makes no regulation as to the nature of the conveyance from one party to another. An ordinary bargain and sale or quit claim deed will stand as a conveyance of mining property in any court or

before the Commissioner of the General Land Office.

The real owners of the mine having also the possessory title to the lode are the persons to whom it is proper to deliver the patent, notwithstanding that they may not be the parties named in it as it was originally made out.

If any conveyance has taken place after the original applicants have commenced proceedings for a patent, but before the entry is made at the local office, the Register's certificate and Receiver's receipt must be made out in the name of the grantee. Upon filing a deed in the General Land Office, the Register and Receiver will be instructed so to make out the certificates and receipts. If, however, the transfer takes place after the date of entry, an endorsement should be made in the duplicate receipts by the applicant, assigning all right and title in the premises described. The patent will then issue in the name of the grantee. Transfer of interest from the original locators to the applicants must be shown by abstract of title. The patent can therefore issue to the assignee of a party making the entry.

VII. If the claim is transferred by a quit claim deed before the U. S. patent is granted to the original locator, can he, the original locator, take out a U. S. patent in spite of such transfer? He certainly cannot. This question is partly answered in the foregoing answer. The grantees have in such case simply to file a deed from the original applicants for the patent (they having sold after proceedings for patent were commenced) and the Register and Receiver will be instructed by the Commissioner to have the certificates and receipts made out in the name of the grantee. It is even decided that a patent will be delivered, under some circumstances, to parties who satisfactorily show that they have the possessory title to a lode, even though such patent was made out in the name of others.

## Expensive Plodding.

We are told by Messrs. Morey & Sperry, of New York, who are building improved mining machinery, that they find in their travels in Colorado an immense wastage of time, power and wear of machinery for the lack of knowledge in running stamp mills. They found in one instance stamps running on decomposed (soft) ore at 19 drops per minute, with 12-inch drop; whereas, six inches fall and 80 drops per minute would have accomplished four times the work. On the contrary, a neighboring mill, on very hard ore, was set with eight-inch fall and making 60 drops, crushing only one-half of the average of California stamps. On the same kind of ore a mill erected by Morey & Sperry, running at 90 drops a minute, averaged 18 tons per stamp, with 60 mesh screens.

The amount of fall and rapidity of drop of quartz mills for different grades of ore is worthy of more careful experiment by mining men generally. A free discussion of the matter in our columns would result in great good, no doubt, to both readers and writers. When the mining department of the State University is thoroughly organized, this matter ought to be investigated, as there seems to be no chance of the Government ever instituting a course of experiments in metallurgy. It would, however, pay the Government handsomely by increased prosperity among the mining classes of its citizens, now a very large one.

**BULLION SHIPMENTS.**—Since our last issue shipments of bullion from the prominent mines have been as follows: Northern Belle, Nov. 16th, \$4,856.74; Leopard, 15th, \$4,800; Alps, 16th, \$4,689; Tybo, 13th, \$8,250.86; Martin White, 5th, \$17,647; California, 17th, \$208,896.61; Con. Virginia, 17th, \$146,277.07; Standard, 12th, \$34,167.32; Northern Belle, 14th, \$4,692.36; Arizona, 15th, \$1,549.63; Arizona, 17th, \$715.12; Tybo, 15th, \$3,979.92; Manhattan, 12th, \$12,735.66; Manhattan, 18th, \$12,178.85; Endowment, 17th, \$2,350.50; Martin White, 15th, \$18,647.41; Grand Prize, 19th, \$20,700; Alps, 19th, \$3,849; Northern Belle, 17th, \$5,138.36; Leopard, 19th, \$3,300; Alps, 20th, \$1,976; Tybo Consolidated, 17th, \$3,834.

**RICKARD'S** patent oxidizing and chloridizing furnace, for roasting ores prior to leaching or amalgamating them, is a new invention recently introduced. One of these furnaces is now being erected by the Aztec G. & S. M. Co. at their mill in Aztec district, Santa Rita mountains, Arizona. A model and drawings of the new furnace may be examined at the office of the Aztec mining company, 302 Montgomery street, rooms 14 and 15, and miners interested in furnaces will do well to look at them.

**INFORMATION** wanted of Elijah Morse, an old gentleman who was reported to have died somewhere in California about a year ago. He has relatives living in Clayton, Michigan, who are anxious to hear from him. Any information sent to this office will be forwarded to his friends.

The big air pipe of the Savage mine is 1,300 feet long, 20 inches in diameter, and made of galvanized iron. This takes the place of the old wooden boxes formerly used for conveying the air.

NEXT week we shall illustrate a combined bird cage and fish aquarium, an ornamental and useful device for a holiday present. The illustration is unavoidably deferred this week.



## HYDRAULIC MINING IN CALIFORNIA.\*

No. 7.

(By A. G. J. BOWIE, JR., A. E., Mining Engineer.)

## The Supply or Feed Pipes.

The water is conveyed to the claims in iron pipes from the pressure box, and by means of iron distributors on the lower end of the feed pipe is distributed to the discharge pipe as required.

The pressure box should be strongly built, and the water supplied in sufficient volume to keep the top of the pipe covered several feet. A grating on the end of the flume, which connects with the box, prevents the entrance of foreign material, such as sticks, leaves, etc. The pipe is of uniform diameter down to the distributor, except where it enters the pressure box. Here it swells to a funnel-shape, connecting at its greatest diameter with the box. The size of the feed pipe is determined by the head and quantity of water to be used. The thickness of the iron of which it is constructed varies with the diameter of the pipe and according to the hydrostatic pressure.

As it is not desirable to alter the position of the main feed pipe often when in place, it should descend in the most conveniently direct line into the diggings, avoiding as far as practicable all angles, rises and depressions. Air-valves, with floats or such valves as will open and close automatically, should be arranged at proper points to allow the escape of air when filling the pipe, and also to prevent any collapse from atmospheric pressure should a vacuum occur.

Where the pipe passes over steep banks into the claim it is carried on an incline trestle and braced, care being taken to prevent any movement or sliding of the column.

When necessary, the pipe is secured with frame-work and weighted with stones. At the bottom of this incline, where it reaches the bedrock or level of the workings, it is securely braced and weighted.

A distributing gate (made of cast-iron into which the supply pipe is led and from which one or more branches can be taken as wanted by means of valves) is generally placed at this point. In some claims double distributing gates are used, in others the main pipe is here forked by means of a breeching having two branches, and a distributor placed on each branch. The branch pipes (generally 11 and 15 inches in diameter) connect direct with the discharge nozzles.

The annexed sketch shows the form of a single "distributor" used in hydraulic mines. This style of distributor is also used as a discharge gate for reservoirs.

In filling the feed pipe the water should be turned on gradually, all sudden straining of the column being thus avoided. Any leakages in the slip joints can be readily stopped with the assistance of a few bags of saw dust and by wedging them with thin pieces of soft pine.

## The Discharge Pipes.

The discharge pipe most generally used is called the "Little Giant."† It is portable and easily handled, having a knuckle-joint and lateral movement. The "Giants" have stream concentrators, and the nozzles used are from 4 to 9 inches in diameter, 5½ to 7-inch nozzles being those most generally in use. The number of "Giants" employed in a claim depends on its size and quantity of available water. There are generally two or three used in a claim.

The annexed sketch (Fig. 1) shows the general form of the Little Giant. Fig. 2 represents a Monitor hydraulic machine with a "deflecting nozzle," the invention of Mr. Henry C. Perkins, Superintendent of the North Bloomfield mining company.

By means of the "deflecting nozzle" the Giant can be turned to any point and the stream issuing from the pipe can be directed with the greatest facility. Its workings will be easily understood from the following explanation: A, cast-iron nozzle. B, deflecting nozzle of wrought sheet-iron, attached to A by a joint similar to a compass gimbal. C is a lever to govern the movement of B. D is a rest for lever B. The operation is as follows: When the lever, C, is in the rest, D, the deflecting nozzle, B, allows the stream of water from nozzle A to pass through without obstruction. To move the pipe, either to the right or left, or up or down, the lever is taken from the rest and thrust in the direction in which it is desired to throw the stream. This throws the deflector, B, into the stream of water, and the force of the water striking it moves the entire machine. The joint attaching B to A being a universal joint, the nozzle can be turned in any direction.

## Storage Reservoirs.

When water is not taken from running streams the mines are dependent for their supply on the winter rains and snows. Large reservoirs are built to catch the water from the rains and melting snows, and store it in the spring and summer months for use during the dry season.

The North Bloomfield company has established a complete system of storage reservoirs. The Bowman reservoir, and the small reservoirs about it, will hold, when the main dam is completed to a height of 96 feet 3 inches, about 1,000,000,000 cubic feet of water. The cost

of the reservoirs and dam to date is \$214,392.06.

The Rudyard reservoir, of the Milton company, contains 535,000,000 cubic feet of water or 3,980,000,000 gallons. Their reservoir is formed by three dams; highest, 100 feet vertical, and its cost was \$150,000. The storage reservoirs of the Eureka Lake and Yuba Coal Company, consisting of the French, Weaver Lake and Faucherie reservoirs, have an estimated aggregate capacity of 819,800,000 cubic feet of water. Independent of these reservoirs, all mines at a convenient distance from their works have what are called distributing reservoirs. From these places water is easily distributed to the claims, or they are used to retain the sur-

high water area 328 acres; catchment basin, 5.10 square miles.

All the foregoing dams are built of dry rubble stone and faced with a water-tight lining of plank. The Tuolumne County Water Co. has several large dams built of timber cribs. The largest dam built by this company is across the south fork of the Stanislaus river.

It is over 60 feet in height and 300 feet wide on top (across the stream), forming a reservoir with 300 acres high water area. Its catchment is of large size, and great freshets pass over the dam. The dam is at an elevation of about 8,000 feet above the sea level.

It is built of cribs of round tamarac logs from two to three feet in diameter, and with no stone

place. The total cost of the dam did not exceed \$40,000.

Pine dams, owned by the same company, constructed on the same plan, have decayed; while cedar cribs are still in perfect order.

The Spring Valley Company's Concow reservoir is formed by two earthen dams, each about 55 feet in height; one of these dams, which is used as a waste, has its lower side built of heavy brush, embedded in the earth.

The catchment basins of most of these reservoirs embrace bare mountain slopes and valleys, and in ordinary seasons from 60% to 80% of the rain and snow fall flows into the reservoirs.

\* These details were received from Mr. Dobie, who for many years had charge of the reservoirs and ditches of the Tuolumne County Water Co.

## Mistakes in Mining.

We see by the *Coso Mining News* that the Modoc furnaces have been shut down by Mr. Guptill, Superintendent, in consequence of the ores having assumed so "dry" a nature that it is impossible to smelt them at a profit. A mill is now demanded before the Modoc can hope to place itself on a paying basis. "When ores can be milled for \$10 to \$12 per ton it is worse than folly to smelt at an expense of \$30 to \$50 per ton."

This must be interesting news for the stockholders who have bought into this company in hopes of making anything out of bona fide mining operations. Of course those who intended doing nothing more than dabbled in the stock found out what was coming before and have probably dropped their stock before the announcement of a proposed change in the metallurgical operations. The *News* says that "there are dry ores enough now on the dump and in sight to pay for a 10-stamp mill, and this, with the amount to be raised by the present assessment, will be quite sufficient to pay for the mill and the removal of works to the proper sites."

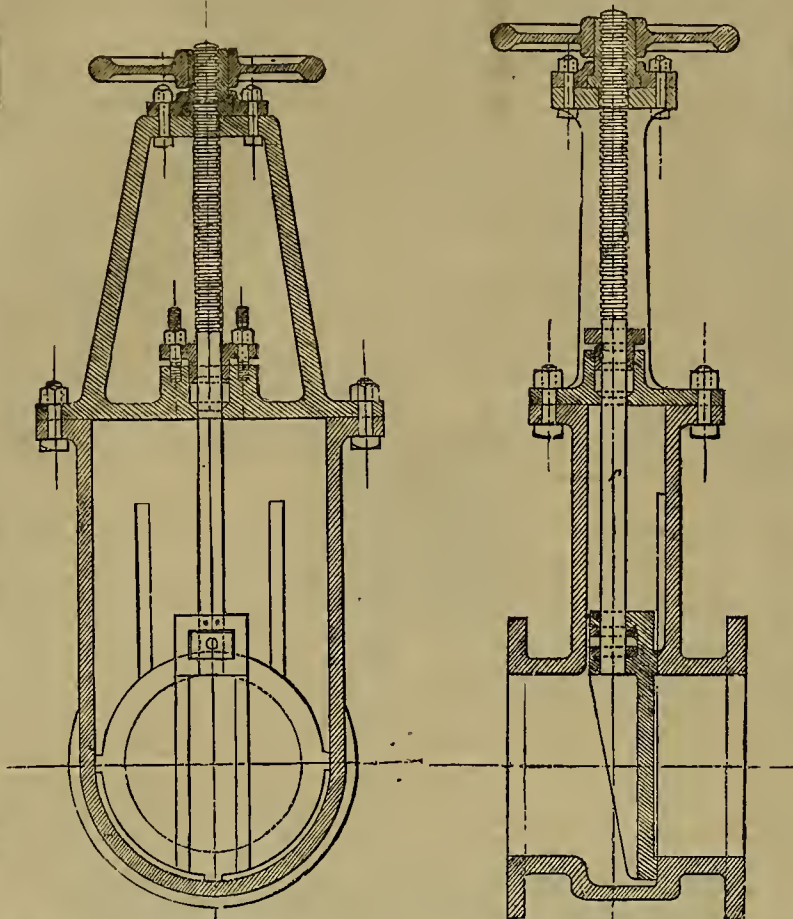
We do not exactly see, however, how this milling ore on the dumps and in sight is going to pay for a mill before it is milled, and therefore conclude that another assessment will be levied as soon as the present one is paid. At least that is the natural conclusion. Moreover, in such cases, where a mill is to be built, there always is ore enough in sight to pay for it, but the money has to be forthcoming to pay for the machinery for it.

When the new mill is up and the works removed to the proper sites the *News* says there will be a clear saving of \$10,000 per month now paid for packing ore, coal, wood and other supplies up hill and hauling down hill. The fact of the business is, says the local journal referred to: "No one but a lunatic would have located smelting works where they are at present, when there existed the finest chance in the world of building chutes and carrying the ore down to the works by their own momentum. If the present directors are business men and care anything for the future of their property and the interests of the stockholders they will certainly indorse the action of Mr. Guptill, and at once give orders for the mill and the removal of the works down to the tunnel level."

It would be well for the stockholders of this company to carefully hear in mind the name of the Superintendent who put the works where they are, and also of those in authority at the time the work was done, and be equally careful never to have anything to do with any company in which any one of them is concerned hereafter. There are sins of commission and of omission, and if the superintendent did not know that it was cheaper to send things down hill than up, the directors ought to have looked out for some one who did. They must certainly find it easier for a company to go down hill than up under some circumstances.

The truth of the matter is, people are too apt to trust their interests, involving large outlay in mining operations, to incompetent and ignorant persons. They let the principal stockholder choose some relative or friend for superintendent, and then invest their money without inquiring further concerning him. This is all wrong. If sensible men get into a company which they see is mismanaged, and they are unable to prevent it, they get out as soon as possible. But the great majority never see the mine, never know the superintendent, and take everything for granted. Then it happens that smelting works are put up for milling ore, or mills for smelting ore; works are put up on a hill instead of below the mine, or placed too far from mine and water, and the result is a crop of assessments instead of dividends. Much of this could be prevented by employing competent mining engineers, not interested in the company, to make a thorough examination and abide by their reports. But when money is invested in undertakings of this character on the report of some pretended expert with more geological terms on the tip of his tongue than knowledge of geology in his head, the projectors are apt to come to grief.

A London mining paper, in referring to the millionaire miners of the Pacific coast, says: At a time when mining is so much decried in certain quarters, it is well to point to the fact that the majorities of the millionaires of to-day in the United States have been, or are, miners.



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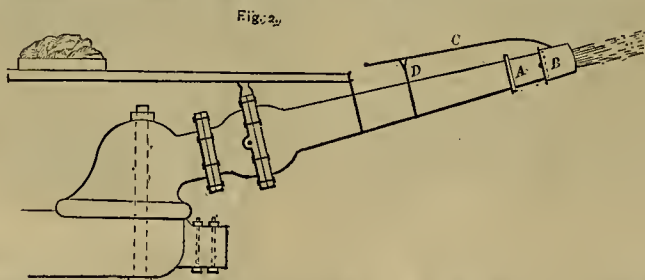
plus coming from the main ditch when the claims are shut down.

## Dams.

In California the rainfall from the first of May to the middle of October is inconsiderable, and hence, in order to secure a permanent supply of water for the hydraulic mines, it has been, in

filling. The cribs are about eight feet square from log to log (say 10 feet center to center), and the timbers pinned together by wooden tree nails. The dam rests for its entire base on solid granite bedrock. The angle of face with horizon is 50°.

The face is formed of flattened eight-inch



"MONITOR" HYDRAULIC MACHINE WITH DEFLECTING NOZZLE.

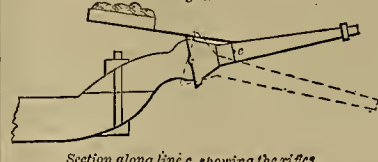
many cases, necessary to form large reservoirs, in which water is impounded during the rainy season, or while the mountain snows are melting, and which is used to supply the mines during the dry months.

Large dams of earth, timber or stone have been constructed to form the storage reservoirs. Among the most considerable dams in the State are the Bowman dam, height, 100 feet; catchment, 28.94 square miles; three dams owned by the Milton Mining and Water Company, forming the English reservoir; the largest of these dams having a height of 131 feet from the deepest portion of its foundation to its summit; this reservoir impounds 618,000,000 cubic feet of water, has a high water area of about 395 acres and is fed from a catchment basin 12.10 square miles; the cost of these dams has been about \$150,000; the Fordyce dam of the South Yuba Canal Company, height, 60 feet, costing about \$160,000; catchment basin about 40 square miles; the Eureka Lake dam of the Eureka Lake and Yuba Canal Company, height 68 feet, storage capacity 630,000,000 cubic feet;

timbers, pinned with wooden tree nails to the crib, and calked with cedar bark. The flood water passes over the crest of the dam for its entire length.

The Little Giant. (Hoskin's patent.)

Fig. 1.



Section along line c, showing the rifles.



The water is drawn off by several gates, one above the other, placed on the inclined water face. When a gate is opened the water flows directly into the interstices of the crib.

The dam was built in 1856, and has needed no repairs. Large derricks lifted the logs into

\* A paper read before the American Institute of Mining Engineers of the Wilkes-Barre meeting, May, 1877.

† Other nozzles in use are the "Dictator," by Mr. Hoskins, who also invented the "Little Giant," Craig's "Globe Monitor," and one by Mr. F. Fisher, called the "Hydraulic Chief."

\* French reservoir, 661,000,000 cubic feet capacity; Weaver Lake reservoir, 100,000,000 cubic feet capacity; Faucherie reservoir, 58,800,000 cubic feet capacity. See Report J. D. Hague, M. E., pp. 15, 16, 17.



## Instruments of Precision.

(Read before the California Academy of Sciences, November 5th, 1877, by PROF. GEORGE DAVIDSON.)

In a former paper, I called your attention to the geodetic instruments of precision used in Europe and in the United States, stating the objects to be kept in view in their construction, and pointing out the principal features of excellence and of weakness. Before referring to that fundamental instrument upon which geodetic work must rely for its accuracy, I cannot refrain from mentioning one or two of the foremost reasons for the slow progress made in approximating a perfect field instrument. In all geodetic work, portability, accuracy and maintenance of adjustment are essential to rapidity of progress and precision in the results. To attain these, it is demanded that the following conditions, at least, be fulfilled: Simplicity of design, fewness of pieces, superiority of metal, harmony of parts, accuracy of workmanship, fine graduation without systematic error, adequate micrometer-microscopic power, micrometer screws devoid of mechanical defects, trustworthy levels, and commensurate optical power.

Unfortunately, we frequently find observers who lack the peculiar faculty of judging of the relationship suggested, or, if able to point out any given defect, they may not have the mechanical ability to state explicitly the character of the defect. Then again, the instrument maker is very rarely an observer, and even when the skilled observer proposes a modification suggestive of an improvement, it is with the utmost difficulty that the change can be effected. The maker will not or cannot see wherein his work is not equal to all the requirements of the instruments, and every observer must have experienced the objections raised to every modification or new design proposed by himself. Even when the maker is anxious to carry out the proposed improvements it requires the highest mechanical skill to effect the final corrections, which are necessarily microscopic in their amount.

## Base Measuring Apparatus.

This is the groundwork of all the higher geodetic measurements. Upon it, as the unit of length, depends the results which give us the size and form of the earth, the distance and size of the planets. It is as far removed beyond the ordinary surveying chain as the astronomical clock exceeds the ordinary watch. Nevertheless, this instrument must combine portability, simplicity, comparative rapidity in manipulation, and accuracy of measurement in an eminent degree. Of the various forms of base apparatus in Europe, I know of none that so satisfactorily fulfills the requirements of a field instrument of precision as the compensating base apparatus of the coast survey, whilst the subsidiary base apparatus has no counterpart for the special duty for which it was designed.

All wooden, glass and metallic base measuring apparatus have the lengths of the bars changed by changes of temperature. These changes of temperature are measured by the thermometer, an extraneous instrument that in fact only records its own changes. The change of a metallic bar may or may not be denoted by the change of temperature indicated by the thermometer. The bar may receive or part with heat at a different rate than the thermometer, or its changes may precede or follow the changes indicated by the thermometer. If the thermometer does not accurately denote the changes of the measuring bar in time and relative quantity, no proper corrections can be applied to the results given by the bar. If, therefore, the base-work of the whole geodetic system is erroneous, the development of error follows the expansion of the system of triangulation.

But it is possible by the use of two metals having different values for specific heat and different heat-conducting powers, to so combine them as to obtain two points in the system, that shall be at an invariable distance apart, whatever be the temperature of the system or whatever changes of temperature are taking place in the system. You have such a compound system in the gridiron and in the mercurial pendulum of the astronomical clocks, and in the compensated balance of the chronometer.

I do not propose at this time to enter into any detailed description of such apparatus; that is fully given elsewhere; but it is in order to state that when a compound bar of brass and iron is used as the base measuring unit, two methods are at once suggested as available for having two points of the system at an invariable distance apart.

1. The brass and iron bars having the same cross section, may be coated with such varnishes as experiment indicates should give heat-conducting power to either bar in inverse proportion to their power of conductivity.

2. The brass and iron bars should have their surface and cross section properly proportioned to their specific heat and conductivity.

In the English or Colby apparatus the former principle was applied; in the American apparatus the latter has been adopted, and the cross sections of the two bars have so determined that whilst the two have equal absorbing surface, their masses, corrected for their different rates of conductivity, are inversely as their specific heats. If there had ever been any doubt of the superiority of the method chosen

by the Coast Survey, it is fully dissipated by experience.

In the measurement of the base lines of the great trigonometrical survey of India, since 1830, a base apparatus, precisely similar to the Colby compensating base apparatus of the Ordnance Survey has been employed. Elaborate descriptions thereof have been published, and one or two features only need be mentioned in establishing a comparison of its working capacity with that of the Coast Survey. Of course the comparison holds good for the original (1827) Colby apparatus of the Ordnance Survey. In the Indian apparatus there are six compound bars, each 10 feet in length, with fine microscopes connecting the bars, and one at each end of the six, so that when all these are in line, the length of each measure is about 63 feet. Each of the compound or compensated bars, the one brass and the other iron, has the same cross section, 0.55 by 1.50 inches, and they are placed on their broad sides, 1.30 inches apart. That each component, brass and iron, might acquire the same temperature in the same time, experiments were made which seemed to show that it was possible to give them appropriate coatings, which would reverse their normal capacities for heat. This is the fatally weak point of the system of compensation, and in the excessively hot climate of India has given rise to much trouble, and the radical mistake has been only partially overcome by the patience, skill and ability of the observers.

The adjustment of bars and microscopes is tedious; and as the measurements are invariably made with the bars horizontal and never hypothenusal, care is taken to select ground either level or gently undulating. When there is considerable slope the measurement is made with sets of two or three bars instead of with the six.

Col. Waugh reports\* that "Col. Everest in his work on the Indian arc, has stated that no dependence can be placed on the permanent length of the compensation bars. One cause of this lies in the difference of temperature between the two metals in the compound bars at any given moment, independent altogether of the absolute temperature." \* \* \* "From sunrise their length first increases a little and then diminishes for a time, although the temperature [as recorded by the thermometer] is rapidly increasing; after which they again expand, the heat still increasing." \* \* \* "The only remedy available to us for this inconsistency in the length of the compensation bars, is to compare them with the standard under circumstances exactly identical with those prevailing during the measurement."

It was also discovered by Capt. Herschell† that part of the fluctuations in the lengths of the compensation bars was contingent upon the positions of the bars relatively to the sun, and to prevailing winds during the comparisons; and consequently part of the fluctuations are functions of the azimuth of the base lines (supposing the sun to be unclouded) and the direction of the winds!

In the comparisons instituted with the standard bar it was found that the relation of the two bars of the compound bar with the standard bar and with the wall of the house by the side of which the comparisons were made, also affected the compensation. This led to the method of daily comparison with the standard in the field. Even then it is very questionable whether good comparisons can be obtained. Certainly every conceivable source of error was present, from the fundamental mistake of adopting an erroneous principle; and supposing the errors measurable and controllable, the labor of computation becomes excessively tedious.

All the base lines measured with this instrument have, with three exceptions, been divided into three or four sections, the relative lengths of which have been compared by triangulation along one or both flanks for the purpose of verification. One of these exceptions is the Cape Comorin base of 1869, which was measured, "not so much with the view of very great accuracy, as ascertaining the errors to which base lines measured with this apparatus are liable. This was to be effected by comparing the results of four independent measurements of the base, and by determining the magnitudes of the errors which may possibly occur in each of the several processes of the operation."‡

A systematic series of comparisons with the standard bar was made during the measurements; and in order to determine the actual temperature of each bar, two wells were sunk to a depth of seven-eighths of an inch into each of the components of one of the six compound bars, at a distance of two inches outside the points of support, in order to receive the bulbs of the thermometers which were required to indicate the temperatures. The standard bar had also similar wells, and all were filled with oil to facilitate the conduction of the temperatures of the bars to the thermometers. Here was thus introduced a third probable source of error.

All the measurements were made under tents composed of a four folds of cloth of various colors to prevent the passage of heat, and every practical device exhausted to obtain trustworthy results.

Since the use of the Colby compensating base apparatus in 1830, there have been measured for the great Indian schemes of triangulation, ten bases, of which nine averaged 7.17 miles and the Cape Comorin base (1869), which meas-

\* Great trigonometrical survey of India, Vol. I, standard of measure and the base lines. Dehra Doon, 1870.

† Op. Cit.

ured 1.68 miles.\* The average actual working time of each of ten measures of the first nine bases was 35½ days, excluding the time occupied in making comparisons with the standard bar. The four measurements of the Comorin base occupied 33 working days. This short base was measured as before stated for a special purpose; for the practice in the great trigonometrical survey has been to bases of about seven miles. The time occupied in measuring these bases has been more than double that required in the use of the Coast Survey apparatus, whilst the method of supporting the bars permits the measurement to be made on slopes as great as five degrees.

Lest you may suppose for an instant that I have expressed a too rigorous judgment in this question of base apparatus, I not only refer you to the published reports of the great Indian survey, but to the following remarks of Col. Waugh thereon:

"There were no means of ascertaining the actual temperature of the components of the compensation bar at either of the nine base lines which were first measured by it," before these discoveries. "Thus a sensation of dissatisfaction with the performance of the apparatus has been experienced to a greater or less degree by all the officers of this survey who have been brought into contact with it, and there has always been a feeling of disappointment that the accuracy of the operations was not in keeping with the powers of micrometric measurement."‡ And I may add with the skill and patience of the observers.

In comparison therewith our repeated measurement of bases in the United States indicate with almost mathematical certainty that the length of each base is given within its one millionth part. In other words, if the Coast Survey measured a base of 1,000,000 yards or 568 miles in length (i. e., from San Francisco to Portland), we might rest assured that the error thereof would not amount to one yard.

\* Op. Cit.

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Patented May 12, 1873.  
USE NO OTHER, AND INQUIRE FOR THESE  
GOODS ONLY.

SCRIBNER'S  
LUMBER and LOG-BOOK  
OVER HALF A MILLION SOLD.

Most complete book of its kind ever published. Gives  
correct measurement of all kinds of lumber, logs and  
plank by Doyle's rule, cubical contents of square and  
round timber, stave and heading bolt tables, wages, rent,  
board, capacity of cisterns, cord-wood tables, interest, etc.  
Standard book throughout United States and Canada.  
Ask your bookseller for it, or I will send one for 35 cents,  
post-paid. G. W. FISHER, P. O. Box 238, Rochester, N. Y.

SOLD ON THE PACIFIC COAST BY

DEWEY & CO., San Francisco,

And mailed post-paid on receipt of 35 cents in currency  
or postage stamps

### MINERS, ATTENTION!

In reference to the advertisement of Mr. H. C. Perkins,  
warning miners against using my patent Deflecting Joint  
for hydraulic pipes, I want it distinctly understood that  
I fully guarantee all my customers and will defend all  
suits. I think it is probable that by the time Mr. Perkins  
gets through he will realize the difference between com-  
mencing a lawsuit and winning one.

RICHARD HOSKIN.

Dutch Flat, Sept. 17, 1877.

GUIDO KUSTEL,  
MINING ENGINEER and METALLURGIST.  
F. O. Address: ALAMEDA, CAL.

### French Savings and Loan Society,

411 Bush Street, above Kearny, SAN FRANCISCO

G MAHE, Director,



Continued from Page 325.

ing works are now being erected over the Black Jack mine, and in two weeks they will be completed and in running order. At but a short depth from the surface the ledge is 10 feet wide and abounds in pay rock of good quality throughout, much of it yielding as high as \$100 to the ton and upwards. The development is considered the most remarkable of any that has yet come to light in this camp, and it is the opinion of some of our most experienced miners that, as the work progresses, the owners of the mine will have one of the most promising ore bodies ever discovered in Idaho. All the indications are unusually favorable. Florida mountain is certainly looming up, and, with the favorable conditions and prospects of the War Eagle mines, Wagon town and South mountain, it is safe to predict that the new year will usher in upon us a season of prosperity, such as we have not witnessed here for a long time.

At the Empire, work has not been in progress below for the past few days. The machinery is being overhauled and put in good shape preparatory to the winter campaign.

Work is progressing as usual in the Belle Peck, and a profitable winter's campaign is anticipated.

There is a limited number of men at work in the Wagon town mine, and the prospects generally are quite encouraging.

At the Golden Chariot the business is running along finely.

## Montana.

**SALLIE BELL LODE.**—Helena Independent, Nov. 8: Yesterday Mr. John Leeson entered into a contract to run a tunnel to tap the Sallie Bell lode. The distance to be run is 100 feet. When completed it will open the lode to a perpendicular depth of about 100 feet. The contractor is an energetic, practical miner, and will push along the work as rapidly as possible. We are pleased to see the owners of mines resume operations in the Ten Mile district. It shows that they have faith in them and at the same time it will be a good thing for the country as undeveloped mines are useless. The successful running of the Helena smelter has had the effect of stimulating mining enterprise in the Ten Mile district, as the ores there are mostly of a base character.

**LEXINGTON MILL.**—Butte Miner, Nov. 6: The engine for the Lexington mill arrived last Thursday and is now being placed in position. It is of 60-horse power and was formerly in use in the Hendrie mill at Unionville.

The western level on the Stevens lode has reached a distance of 80 feet from the working shaft, and throughout its whole length free milling ore of the high grade that we have already mentioned has been found. At a low estimate, the ore between this level, 42 feet deep and the surface is worth \$10,000.

**PHILLIPSBURG ITEMS.**—About this season of the year we have a slight increase in our population by the arrival of the placer miners from Willow and Rock creeks, and some from pioneer. The boys come here to "winter over," and generally obtain work. Both our mills keep pounding away steadily, and are producing very large amounts of bullion. The quartz that is now being hauled to the mills looks remarkably well. The arastras at Silver lake have been frozen up within the last day or two. The ore worked this season has been very rich, and the owners, Meers, Sloss & Hammond, have done well. There is a report that the Belmont company is to some extent going to resume operations here this winter.

## The Mining and Scientific Press.

We do not know whether our readers need to be reminded occasionally that they get "value received" in the PRESS or not; but as the year is drawing to a close, it is perhaps as well that our subscribers should recollect that it will pay them to continue their subscriptions. New subscribers are, of course, always welcome, and our present readers can assist us greatly by calling the attention of others to the merits of the paper. A glance at the contents of this week's PRESS will convince any one that as a home journal, devoted to industrial pursuits, it is in no way behind other technical journals.

Mining men will find considerable of interest to them in the article on the mining laws, giving, as it does, answers to several important questions. There is also described a new dry placer amalgamator, a new device for saving gold, called blanket riffles, and a new ore feeder just patented. Then there is the continuation of Mr. Bowie's valuable article on hydraulic mining, with appropriate illustrations, giving this time important data concerning the capacity and cost of storage reservoirs and dams. There is also a timely article on "Mistakes in Mining," and some remarks about the failure of the river mining machines which were so much talked of not long since. We give also brief descriptions of the patents granted to Pacific coast inventors for the week. The correspondence page has an article on "Calaveras County Mines," "Wilhelm's Dry Placer Amalgamator," and "Trees and Rainfall." This last is the first of a series of valuable articles on this subject by Mr. Samuel Purnell, a valued contributor. Although general in its nature facts have been collected especially relating to this coast, and the article is a valuable one and worthy of careful perusal.

We give also an excellent article read before the California Academy of Sciences by the President, Prof. Geo. Davidson, of the U. S. Coast Survey, on "Instruments of Precision," which is especially valuable to engineers. To this profession also is devoted another page. The usual departments of "Mechanical Progress," "Scientific Progress," "Useful Information," "Good Health," etc., are given, all of which are of valuable interest. Some seven engravings are given with the articles in this issue. The mining summary is replete with current mining news from all quarters, carefully condensed and in a shape for easy reference. The original matter is by no means confined to the ordinary "editorial" pages, but is printed as well in other parts of the paper. The stock tables, giving all the details of operations for the week, will be found in the usual place.

Altogether we feel that we are doing our duty to our readers in making the paper as interesting as possible, and only desire that our labor to this end shall be appreciated. As we stated before any one who glances at the contents of the PRESS will see that it is just the paper for the miner, manufacturer, engineer and mechanic and the industrial classes generally.

## The Colorado Dry Placer Amalgamator.

**EDITORS PRESS:**—The two or three brief notices of the "Dry Placer Amalgamator" which have appeared in the columns of your valuable journal have sent us more letters of inquiry than have come through any other source, and we have been most liberally noticed by the press generally from New York to the Pacific coast. Please accept our thanks.

The control for California and Arizona has just passed out of our hands. Mr. Chas. H. Howland, of 331 Kearney street, San Francisco, will cheerfully answer all questions relating to the machine in said State and Territory, as also for the colonies of New Zealand and Australia. Mr. H. will also exhibit a sample of gold saved by our machine. Also a few testimonials, both of which, I venture to predict, will very greatly surprise you. He will, no doubt, soon have a machine in operation not far from your city. Respectfully yours,

E. S. BENNETT,  
for DUHEM & BENNETT.

Denver, Colorado.

This letter is only another proof of the usefulness of the PRESS, not only to those who have mining appliances to introduce, but also to those who need such appliances. It shows also that the mining community are interested in any new improvements, and look to the PRESS to point them out. This we always endeavor to do. The notices in this journal brought these gentlemen more letters of inquiry than those in all the other papers combined; and they say they were liberally noticed from New York to the Pacific. Advertisers will do well to bear this point in mind, as it indicates the proper medium to reach most satisfactorily and reliably the mining community—a class of people scattered over a large area of territory. The PRESS, however, circulates in every camp on the coast, large and small, and is read by miners, millmen, superintendents and mine-owners generally.

## Blanket Riffles.

Mr. J. C. McCurdy, whose dry placer machine we described last week, has shown us another mining appliance which he has invented, for saving gold in a quartz mill. A blanket is taken and cut into strips, and these strips sewed together so as to fit into the sluice under the settler. The edges of the strips of blankets then form a series of riffles for catching quicksilver, gold and sulphurets. The blanket riffles are about six inches apart.

Under the blanket are several half oval bars of iron flat side down, which extends longitudinally through the sluices, and are fastened together. A bell-crank motion moves these bars laterally back and forth under the blanket riffles and they serve to keep the material gently stirred up so that the tailings will flow off readily. By this lateral motion of the bars under the blanket, the pulp is prevented from packing. The edges of the blanket riffles are of the very best form for catching gold and quicksilver, and the blankets can be taken out and washed or eventually burned in the usual way.

The device is intended to be placed below all the mill machinery to catch gold, quicksilver and sulphurets. The expense of the appliance is trifling in itself and the blanket riffle can be replaced as often as desirable. The half-oval bars, or mullers, can also be used to advantage in under currents in hydraulic mines, to keep the sand from packing and assist it in flowing off.

## General News Items.

A BILL has been introduced in Congress to establish a department of commerce.

GEN. PEARSON has been acquitted of the charge of murder in connection with the riots of July last at Pittsburg.

DAVIS has introduced a bill in the House for the erection of a post-office building at San Francisco.

KEARNEY and the other men who were arrested recently for riot, have been released from custody.

THE Collateral Savings and Loan Bank, burst up last week, John Tyler, Jr., the manager is in jail.

THE Mercantile Library Association of this city is now entirely out of debt, the first time since 1866. The building and library of the association are worth, probably \$300,000.

**HYDRAULIC MINING.**—The article on this subject from the pen of the well-known engineer, Aug. J. Bowie, Jr., which is now being published in the PRESS, is an especially valuable one, and our hydraulic mining friends will find it alone worth more than a year's subscription to the PRESS. The facts and figures given by Mr. Bowie are of great value as showing the results of practical work. A reliable article of this kind is more profitable for miners to read and study than any other class of literature. We advise those who do not usually file away the PRESS to commence keeping their numbers now and they will have this standard article as a whole. It has been carefully revised and corrected by Mr. Bowie and comprises the whole literature of hydraulic mining in California.

## PATENTS AND INVENTIONS.

### List of U. S. Patents Issued to Pacific Coast Inventors.

[FROM OFFICIAL REPORTS FOR THE MINING AND SCIENTIFIC PRESS, DEWEY & CO., PUBLISHERS AND U. S. AND FOREIGN PATENT AGENTS.]

By Special Dispatch from Washington, D. C.

WEEK ENDING NOVEMBER 6TH, 1874.  
TREADLE.—Hans Shogren, Portland, Ogn.  
MEN'S DRAWERS.—Henry Borkhim, S. F.  
HINGES.—Benj. Fabnestock and Henry F. Peckham, Watsonville, Cal.  
MACHINE FOR FORMING INSERTIBLE SAW TEETH.—William Hawkins, S. F.  
VEHICLE SEAT.—Fred'k Oppenheim, S. F.  
VEHICLE SPRINGS.—Fred'k Oppenheim, S. F.  
CATCH FOR SLUICE COUPLING.—Ambrose A. Osborne, S. F.  
CAR TICKET NIPPERS.—Jas. Thomas, S. F.  
PROCESS OF SEPARATING METALS.—Courad Wiegand, Virginia City, Nev.  
OVERALLS.—Leon Atkinson, S. F.  
CAN OPENER.—James P. O. Lownds, Portland, Ogn.

The patents are not ready for delivery by the Patent Office until some 14 days after the date of issue.

NOTES.—Copies of U. S. and Foreign Patents furnished by DEWEY & CO. in the shortest time possible by telegraph or otherwise at the lowest rate. All patent business for Pacific coast inventors transacted with perfect security and in the shortest possible time.

### Highest Award to the Averill Mixed Paint.

At a meeting of the Board of Managers of the Mechanics' Institute held in this city, Tuesday evening of this week, the committee on Mixed Paints submitted a long and interesting report, which we deem of such importance to our readers that we hasten to make prominent some of the leading points. The award of the Institute medal, highest in the gift of the society, was made to the California Paint Company over all competitors; and the report, as we shall show, is unequivocal in favor of the Averill Mixed Paint manufactured by the company named.

The committee appointed by the Institute for the examination of mixed paints were, Profs. Hilgard and Rising of the California State University, W. B. Ewer, Mr. Frost of Frost & Richards, Mr. Hopps of Hopps & Sons, two leading firms of practical painters.

The claim for the Averill paint was, that it is the best mixed paint and the award certified the truth of this claim.

The tests were in every way fair and impartial and the committee were furnished with the material distinguished by numbers and not by its name. Samples were taken by the Secretary from the exhibits at the pavilion and put in unlabeled cans and with this unnamed material the committee dealt until they reached their conclusion concerning composition, etc.

The first test was the application of the paint to a board surface in the pavilion by a painter who did not know the name of the paint he was using. All the mixed paints entered were tested in this practical way to determine their spreading qualities and covering power. On this first test it appears from the report that the Averill mixed paint was declared the best.

Then samples of each paint were delivered to Profs. Hilgard and Rising for analysis at the State University. These analyses showed that the Averill mixed paint was composed of the materials as claimed, namely: white lead, zinc and pure linseed oil, and unadulterated. The chemists also report in the Averill paint the presence of silicate of soda, or "water-glass," and speak highly of the use of it as a means of holding the lead and oil in permanent chemical solution, so that no separation and consequent degeneration of the paint can occur. They draw a contrast between this and ordinary paint. In ordinary paint the oil separates from the lead and this leaves the lead dry, so that it rubs off like the lime in whitewash. This is wholly obviated in the Averill system of manufacturing mixed paint.

The report of the committee details the pains taken to visit houses painted with the competing paints, and they conclude that the Averill mixed paint weathers best, neither "peeling" nor "chalking," and in enduring, retaining gloss, exhibits those qualities which all users of paints desire. Examination was made of houses painted from one to seven years with the Averill mixed paint, and the result was the declaration of its superiority over all other paints.

There has probably never been in this country so thorough a test of paints as was made by the Committee of the Mechanics' Institute. Beginning, as they did, with the working qualities of the fresh paint, they pursued it through accurate analysis of materials and finally applied the practical test of observation where the paint had stood for years the storm and sunshine on exposed surfaces. The award from such an examination and from a committee of men whose names are sure to the community of their honesty, is the highest possible testimonial of the quality of the goods which are offered to the public for their patronage. It would be well for purchasers if all supplies offered them by manufacturers could boast of such evidence of purity, value and endurance.

SUPERINTENDENT BOLANDER has resigned from his position at the head of the school department. Deputy Stowe succeeds him.

## Musical Instruments.

The firm of Kohler & Chase, of 633 and 635 Clay street in this city, is an old established and trustworthy house, dealing in pianos, organs and all other kinds of musical instruments. They are extensive importers of instruments and instruction books, and have long held an enviable position in this branch of trade. We take pleasure in recommending them to all our readers who wish to introduce the refining influences of music to their homes. The firm make a specialty of the Decker Brothers' piano, the Mason & Hamlin cabinet organ, the Emerson piano and the J. & C. Fischer upright piano. All of these instruments have gained a wide fame for excellence and won high praise from those who know best what constitutes excellence in a musical instrument.

We would speak especially at this time of the Decker Brothers' piano. We cannot do better than present a testimonial of its quality, freely given by a group of musicians whose praise will commend itself to all music lovers. During the Centennial there was held in Philadelphia a grand musical congress, at which the Decker Brothers' instruments were used, and the result was the following straightforward endorsement:

PHILADELPHIA, June 27th, 1876.  
The Decker Brothers' Grand pianos, used by the Musical Congress at their grand operatic concert and musical festival, recently given at the American Academy of Music, were remarkable for their superior quality of tone and extraordinary power. Finer instruments we never heard. Clara Louise Kellogg, Annie Louise Cary, Zaida Seguin, Julia B. Rive, Emeralda Cervantes, Joseph White, Max Maretzek, P. Brignoli, S. B. Mills, P. Ferranti, Franz Remmert, E. Behrens.

A matter which we would make most prominent in this connection is, that the Decker Brothers' name is the subject of attempts at counterfeiting. This is the penalty which the manufacturers of a first-class instrument have to pay for the gaining of a good name, and all our readers should be on their guard against imposition. Unprincipled parties have manufactured and sold cheap pianos under the names of "Decker," "Decker & Co.," "Decker & Brothers," "Decker Brothers," etc., doing business on the reputation and popularity of the celebrated Decker Brothers' pianos. \*All genuine Decker Brothers' pianos have their name in front on the pianos above the keys, viz.: Decker Brothers, New York. In all genuine Decker Brothers' square pianos the following words appear, cast upon the iron plate on the inner left-hand side of the instruments: Decker Brothers' patent, June 2d, 1863.

The simplest way to guard against imposition of the kind named is to deal with those who are well known to be trustworthy. Kohler & Chase are parties of this character.

## METALS.

[WHOLESALE.]

THURSDAY, M., November 22, 1877.

IRON.		
American Pig, ton.	28 00	@ 32 00
Scotch Pig, ton.	32 00	@ 33 00
White Pig, ton.	28 00	@ 32 00
Oregon Pig, ton.	32 00	@ 33 00
Reinforced Bar.	3 1/2	@ 6 1/2
Horse Shoes, keg.	5 00	@ 7 00
Nail Rod.	—	@ 7 1/2
Norway, Oval.	—	@ 7 1/2
Rolls.	—	@ 7 1/2
COPPER.		
Copper Tinned.	37	@ 40
Sheathing, lb.	37	@ 40
Sheeting, Yellow.	50	@ 22 1/2
Sheeting, Old Yellow.	10	@ 11
Composition Nails.	21	@ —
Composition Bolts.	24	@ —
STEEL.		
English Cast, lb.	14	@ 25
Anderson & Woods, ordinary sizes.	15	@ —
Drill.	15	@ —
Flat Bar.	15	@ 18
Plow Steel.	8 1/2	@ 12 1/2
TIN PLATES.		
10x14 I C Charcoal.	8 50	@ 9 00
Banco Tin.	24	@ —
Australian.	19	@ 20
ZINC.		
By the Cask.	11	@ —
Zinc Sheet 7x3 ft, 7 to 10, lb.	11	@ —
7x3 ft, 10 to 14.	11	@ —
8x4 ft, 8 to 10.	12	@ —
8x4 ft, 11 to 10.	12	@ —
NAILS.		
Assorted sizes.	3 00	@ 3 25
QUICKSILVER.		
By the lb.	47 1/2	@ 50

## LEATHER.

[WHOLESALE.]

WEDNESDAY M., November 21, 1877.

Sole Leather, heavy, lb.	25	@ 29
Light.	22	@ 24
Jodot, 8 Kil, doz.	48	@ 50 00
11 to 13 Kil.	50	@ 50 00
14 to 18 Kil.	80	@ 50 00
Second Choice, 11 to 15 Kil.	55	@ 70 00
Cornellian, 12 to 15 Kil.	57	@ 67 00
Females, 12 to 13 Kil.	63	@ 67 00
20 Kil.	60	@ 67 50
Simon Ulmo, Females, 12 to 13 Kil.	58	@ 62 00
14 to 15 Kil.	66	@ 70 00
16 to 17 Kil.	72	@ 74 00
Simon, 18 Kil.	61	@ 63 00
24 Kil.	72	@ 74 00
Robert Calif, 7 and 9 Kil.	35	@ 40 00
Kips, French, lb.	1 00	@ 1 35
Cal. doz.	5 50	@ 6 00
French Sheep, all colors.	3 00	@ 15 00
Eastern Calf for Backs, lb.	1 00	@ 1 25
Sheep Roams for Topping, all colors, doz.	9 00	@ 13 00
For Linings.	65	@ 60 00
Cal. Russian Sheep Idlings.	1 75	@ 4 50
Boot Legs, French Calf, pair.	4 00	@ —
Good French Calf.	4 00	@ 4 75
Best Jodot Calf.	5 00	@ 5 25
Leather Harness, lb.	5 00	@ 5 25
Fair Bridle, doz.	48	@ 72 00
Skirting, lb.	33	@ 37
Welt, doz.	30	@ 50 00
Buff.	18	@ 20
Wax Side.	17	@ —



## Signal Service Meteorological Report.

Week Ending November 20, 1877.

HIGHEST AND LOWEST BAROMETER.									
Nov. 14.	Nov. 15.	Nov. 16.	Nov. 17.	Nov. 18.	Nov. 19.	Nov. 20.	Nov. 21.	Nov. 22.	Nov. 23.
30.21	30.23	30.29	30.37	30.26	30.22	30.18	30.13	30.10	30.03
30.17	30.13	30.10	30.07	30.21	30.16	30.03			
MINIMUM AND MAXIMUM THERMOMETER.									
60	60	61	62	65	61	59			
50	55	56	52	52	51	51			
MEAN DAILY HUMIDITY.									
01	83	77	67	77	87	03			
PREVAILING WIND.									
W	N	W	N	W	N	NW			
117	71	187	217	72	05	148			
STATE OF WEATHER.									
Rainy.	Rainy.	Rainy.	Clear.	Clear.	Fair.	Fair.			
RAINFALL IN TWENTY-FOUR HOURS.									
.04	.06	.17							
Total rain during the season, from July 1, 1877. 2.11 in									

## Gold, Legal Tenders, Exchange, Etc.

(Corrected Weekly by SUTRO & Co.)  
 SAN FRANCISCO, November 23, P. M.  
 LEGAL TENDERS IN S. F., 11 A. M., 97 1/2 @ 97 3/4. SILVER, 46 1/4  
 GOLD IN NEW YORK, 103.  
 GOLD BARS, \$200 @ 101. SILVER BARS, 64 1/4 @ 64 1/2 cent. discount.  
 EXCHANGE ON NEW YORK, 1 1/2; on London bankers, 41; Commercial, 60; Paris, five francs @ dollar; Mexican dollars, 95.  
 LONDON CONSOLS, 95 3/16; Bonds, 106 1/2.  
 QUICKSILVER IN S. F., by the tank, @ 1 lb. 46 3/4 @ 47.

## THE POCKET GEOLOGIST

## BOOK OF MINERALS.

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PRICE, POST-PAID, ONE DOLLAR.

Address, FRED. H. SMITH,  
 Civil and Mining Engineer,  
 54 Lexington St., Baltimore, Md.

## TEN PER CENT.

## First Mortgage Bonds

AT PAR.

The Sierra Flume and Lumber Company have mortgaged their large property—principally lands—to secure the payment of 1,200 Bonds of \$500 each, running for one, two or three years and bearing ten per cent. interest, payable semi-annually.

Two hundred Bonds of either series are now offered for sale at par, to close this season's business. The remainder will be held for another year.

The property cost over \$1,400,000, and has produced the last six months \$800,000 worth of lumber; at a cost of \$400,000, most of which is stacked and drying, to be in readiness for sale, and for which there is a good market, both at home and abroad.

Mr. Alvinza Hayward, being the chief owner, will give a written guarantee that the Bonds and interest will be paid at maturity.

Merchants' Exchange Bank Stock will be taken in exchange, at \$75 per share.

For Bonds and further particulars apply to R. G. SNEATH, President Sierra Flume and Lumber Co., 423 California Street, San Francisco.

## QUARTZ MILL AND MINE FOR SALE.

The Quartz Mine situated on Humbug Creek, Siskiyou County, Cal., known as the New Eliza Mine, together with a

## Fifteen-Stamp Mill Complete,

A twenty-five horse-power steam engine, and all the appurtenances thereunto belonging, will be sold at a bargain if applied for soon. For further particulars apply to

C. JUNKER,

Bella Union Saloon, Yreka, Cal.

## TAXES.

1877-1878.

Notice is hereby given, that a certified copy of the Assessment Book of the Taxable Property of the City and County of San Francisco, Real Estate and Personal Property (Subsequent Assessment Book included), for the Fiscal Year 1877-78, has this day been received; that the State, City and County TAXES for said fiscal year are now due and payable at the office of the undersigned, Room No. 1, City Hall, and the Laws in regard to their collection will be strictly enforced.

Taxes will become delinquent on the FIRST MONDAY in January, 1878, and unless paid prior thereto, Five per cent. will be added to the amount thereof.

WM. FORD,

Tax Collector of the City and County of San Francisco.

SAN FRANCISCO, October 22, 1877.

## Montgomery Avenue Tax.

Notice is hereby given that a certified copy of the Assessment Book of Real Estate, which is subject to Assessment to defray expenses incurred by the opening of Montgomery Avenue, has this day been placed in my hands to collect Taxes thereon.

Said taxes are for the Fiscal Year 1877-78, and are now due and payable at the office of the undersigned, Room No. 1, City Hall. All Taxes remaining unpaid on the FIRST MONDAY of January, 1878, will have Five per cent. added thereto.

WM. FORD,

Tax Collector of the City and County of San Francisco.

SAN FRANCISCO, October 22, 1877.

## ASSESSMENT OF LANDS

## Benefited by Widening Dupont St.

Notice is hereby given, that a certified copy of the Assessment Book of the Real Estate which is subject for the payment of Principal and Interest upon "Dupont-Street Bonds," as directed by an Act of the Legislature of California to authorize the Widening of Dupont Street in the City of San Francisco, "Approved March 23, A. D. 1876," has this day been placed in my hands for collection. The Laws in regard to the collection of the same will be strictly enforced.

WM. FORD,

Tax Collector of the City and County of San Francisco.

SAN FRANCISCO, October 22, 1877.

Position Wanted.—A Mining Engineer, with best California references, well experienced in tunneling and shaft sinking, good mill-man, competent assayer and surveyor, desires a position with some mining company, to assist a mining or hydraulic engineer, assayer, etc. Address, M. E., this office.

## Mining and Other Companies.

Persons interested in incorporated shares will do well to recommend the publication of the official notices of their companies in this paper, as the cheapest appropriate medium for the same.

## California and Oregon Land Company.

Location of principal place of business, San Francisco, California. Location of works, Jackson County, Oregon. Notice is hereby given, that at a meeting of the Board of Directors, held on the seventeenth day of October, 1877, an assessment, No. 1, of thirty-five cents per share was levied upon the capital stock of the corporation, payable immediately in U. S. gold coin, to the Secretary, at the office of the company, 418 California Street, San Francisco, California. Any stock upon which this assessment shall remain unpaid on the twenty-eighth day of November, 1877, will be delinquent, and advertised for sale at public auction, and unless payment is made before will be sold on Monday, the twenty-fourth day of December, 1877, to pay the delinquent assessment, together with costs of advertising and expenses of sale. By order of the Board of Directors.

J. W. CLARK, Secretary.

Office, 418 California Street, San Francisco, California.

## Excelsior Silver Mining Company.—Prin-

cipal place of business, San Francisco, Cal. Location of works, Polioz Dab, Lincoln County, Nevada. Notice is hereby given that at a meeting of the Board of

Directors, held on the second day of November, 1877, an assessment of ten cents per share was levied upon the capital stock of the corporation, payable immediately in U. S. gold and silver coin, to the Secretary, at the office of the company, 312 Post Street.

Any stock upon which this assessment shall remain unpaid on the third day of December, 1877, will be delinquent, and advertised for sale at public auction, and unless payment is made before, will be sold on Monday, the seventeenth day of December, 1877, to pay the delinquent assessment, together with costs of advertising and expenses of sale.

W. A. KOLLMAYER, Sec'y.

Office, 312 Post Street, San Francisco, Cal.

## Mariposa Land &amp; Mining Company of

California.—Location of principal place of business, San Francisco, California. Location of works, Mariposa County, Cal.

Notice.—There is delinquent upon the following described stock, on account of assessment (No. 12) levied on the 12th day of September, 1877, the several amounts set opposite the names of the respective shareholders, as follows:

## COMMON STOCK.

Name.	No. Certificate.	No. Shares.	Amount.
Amblerman, Edgar M.	1490	100	100 00
Amblerman, Edgar M.	1528	100	100 00
Amblerman, Edgar M.	1629	100	100 00
Amblerman, Edgar M.	1632	100	100 00
Brumagin, J. H.	1112	100	100 00
Brumagin, J. H.	1117	100	100 00
Brumagin, J. H.	1118	100	100 00
Brumagin, J. H.	1119	100	100 00
Brumagin, J. H.	1351	100	100 00
Brumagin, J. H.	1376	100	100 00
Brumagin, J. H.	1376	100	100 00
Brumagin, Fred P.	1276	100	100 00
Brumagin, Fred P.	1277	100	100 00
Brumagin, Fred P.	1278	100	100 00
Brumagin, Fred P.	1279	100	100 00
Brumagin, Fred P.	1300	100	100 00
Brumagin, Fred P.	1303	100	100 00
Brumagin, Fred P.	1304	100	100 00
Brumagin, Fred P.	1317	100	100 00
Brown, George.	1003	100	100 00
Brown, George.	1009	100	100 00
Bernheimer, I and S.	1001	100	100 00
Boody & Co, D A.	24	50	50 00
Boody & Co, D A.	25	50	50 00
Boody & Co, D A.	1050	100	100 00
Brown, D.	1240	100	100 00
Cody, Edmund.	20	50	50 00
Collins, C P.	1287	100	100 00
Conner, W P.	1263	100	100 00
Cowles, Joseph N.	22	25	25 00
Cowles, Joseph N.	23	25	25 00
Dusenbury, Caroline E.	1219	100	100 00
English, William.	477	100	100 00
English, William.	478	100	100 00
Elston, W A.	1590	100	100 00
Elston, W A.	1591	100	100 00
Elston, W A.	1592	100	100 00
Elston, W A.	1593	100	100 00
Elston, W A.	1594	100	100 00
Fay, Fred J.	470	100	100 00
Harriott & Noyes.	1253	100	100 00
Hedges, Allen.	1100	100	100 00
Henry, T L.	1074	100	100 00
Henry, T L.	1075	100	100 00
Henry, T L.	1076	100	100 00
Henry, T L.	1077	100	100 00
Henry, T L.	1078	100	100 00
James, W H.	1166	100	100 00
James, W H.	1167	100	100 00
Kennedy, Hutchinson & Co.	1040	100	100 00
Kennedy, Hutchinson & Co.	1041	100	100 00
Kennedy, Hutchinson & Co.	1207	100	100 00
Kennedy, Hutchinson & Co.	1208	100	100 00
Kennedy, Geo H.	1157	100	100 00
Kennedy, Geo H.	1158	100	100 00
Loth, M.	411	50	50 00
Loth, M.	412	50	50 00
Mans, Frederick M.	1020	100	100 00
Mans, Frederick M.	1028	100	100 00
Mans, Frederick M.	1029	100	100 00
Monroe, E S.	20	50	50 00
Otis & Co, F A.	1318	100	100 00
Otis & Co, F A.	1320	100	100 00
Post, Joel B.	1264	100	100 00
Post, Joel B.	1265	100	100 00
Rodwell, C M.	1227	100	100 00
Rodwell, C M.	1228	100	100 00
Rathborne, R Wm.	319	100	100 00
Rathborne, R Wm.	320	100	100 00
Rathborne, R Wm.	321	100	100 00
Rathborne, R Wm.	322	100	100 00
Rathborne, R Wm.	323	100	100 00
Rathborne, R Wm.	324	100	100 00
Rathborne, R Wm.	325	100	100 00
Rathborne, R Wm.	326	100	100 00
Rathborne, R Wm.	327	100	100 00
Rathborne, R Wm.	328	100	100 00
Richmond, H W.	1650	100	100 00
Rickard, R H.	1605	100	100 00
Rickard, R H.	1606	100	100 00
Schwartz, M M.	1611	100	100 00
Schwartz, M M.	1612	100	100 00
Stanton, J S.	1631	100	100 00
Townsend, W B.	1010	100	100 00
Townsend, W B.	1011	100	100 00
Townsend, W B.	1012	100	100 00
Townsend, W B.	1013	100	100 00
Townsend, W B.	1014	100	100 00
Townsend, W B.	1015	100	100 00
Townsend, W B.	1016	100	100 00
Townsend, W B.	1017	100	100 00
Townsend, W B.	1018	100	100 00
Townsend, W B.	1019	100	100 00
Townsend, W B.	1020	100	100 00
Townsend, W B.	1021	100	100 00
Townsend, W B.	1022	100	100 00
Townsend, W B.	1023	100	100 00
Townsend, W B.	1024	100	100 00
Townsend, W B.	1025	100	100 00
Vanderhoof, H B.	1599	100	100 00
Vanderhoof, H B.	1600	100	100 00
Vanderhoof, H B.	1601	100	100 00
Waldron, Albert.	1667	100	100 00
Waldron, Albert.	1668	100	100 00
Robinson, Powell & Co.	unissued	1000	1000 00
Smith, Morris H.	unissued	100	100 00
White, Morris & Co.	unissued	200	200 00
Weeks, W A.	unissued	100	100 00

## PREFERRED STOCK.

Name.	No. Certificate.	No. Shares.	Amount.
Ackerman, T J.	A 17	54	54 00
Adams, Thomas.	1190	100	100 00
Adams, Thomas.	1191	100	100 00
Bernheimer, I and S.	1350	100	100 00
Bernheimer, I and S.	1351	100	100 00
Bernheimer, I and S.	1352	100	100 00
Bernheimer, I and S.	1353	100	100 00
Bernheimer, I and S.	A 74	37	37 00
Bernheimer, I and S.	A 75	50	50 00
Bernheimer, I and S.	A 76	50	50 00
Brumagin, J. H.	1308	100	100 00
Brumagin, Mark.	1238	100	100 00
Brumagin, Mark.	1239	100	100 00
Brumagin, Fred P.	1270	100	100 00
Brumagin, Fred P.	1308	100	100 00
Brumagin, Fred P.	1309	100	100 00
Brumagin, Fred P.	1310	100	100 00
Brown, George.	A 30	18	18 00
Birmingham, D Walton.	1320	100	100 00
Birmingham, D Walton.	1330	100	100 00
Birmingham, D Walton.	A 71	50	50 00
Boody & Co, D A.	A 91	19	19 00
Burr, W M.	A 95	67	67 00
Cutting & Co, R L, Jr.	A 87	35	35 00
Cutting & Co, R L, Jr.	A 88	35	35 00
Cutting & Co, R L, Jr.	A 1369	100	100 00
Cutting & Co, R L, Jr.	A 1370	100	100 00
Cutting & Co, R L, Jr.	A 1371	100	100 00
Cutting & Co, R L, Jr.	A 1372	100	100 00



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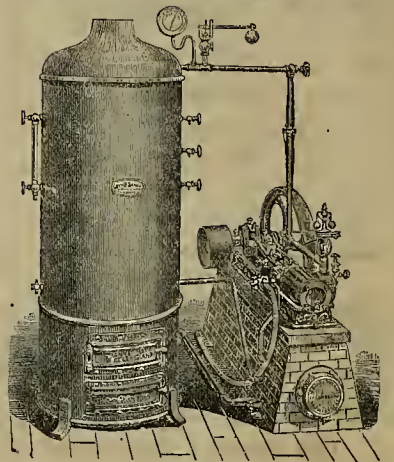
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**Cost of Roasting and Chloridizing 20 Tons  
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One man.....	\$ 4 00
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Wood—2½ Cords at \$3 per cord.....	5 25
Salt—1,600 lbs at 2½ cts.....	40 00

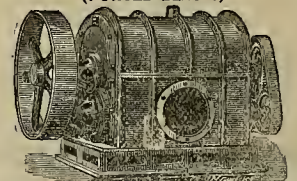
Cost of 20 tons.....	\$52 25
Cost of one ton.....	2 61½

In a furnace of three or four times this capacity the  
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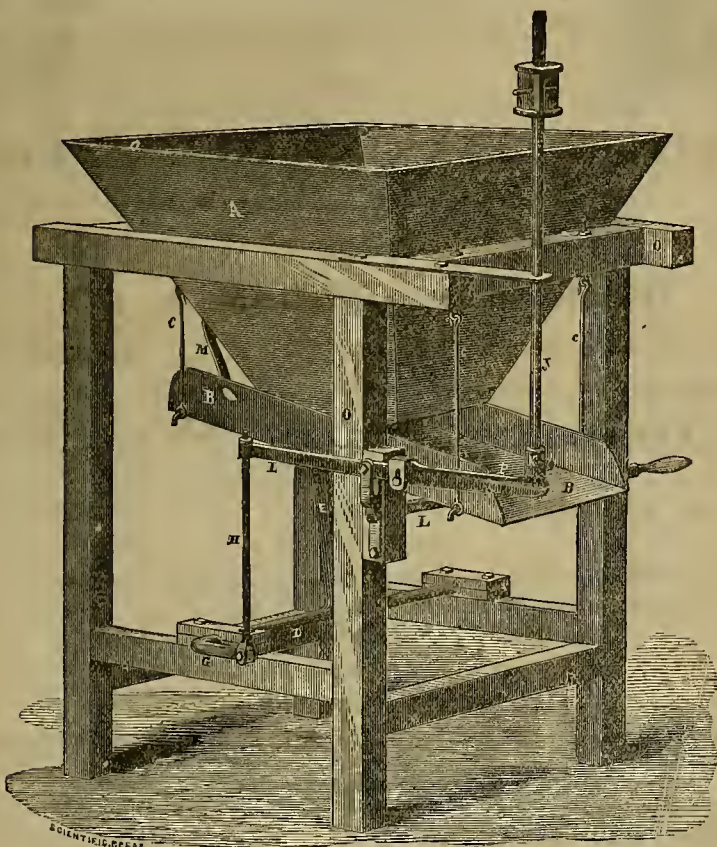
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FRED'K OGDEN, Sole Owner Tulloch Patent,

ROOM 72, NEVADA BLOCK.

Extract from a letter from C. G. Rodgers, Superintendent Green Mountain Mining Co., Plumas County, September 10th, 1877: After using both the Tulloch and Hendy Ore Feeders, side by side, for eight months, I can candidly say, that in my opinion, the Tulloch is much the best machine; it will feed any ore that can be fed by machinery; there is nothing about it to wear out, and should anything break, any blacksmith can repair it. Whereas, the Hendy machine is wearing from the moment it is started, and when any thing is worn out, or broken, you must have a machine shop or foundry to make the repairs. The Hendy Feeders are not in use at the Gold Strike Mill; they were thrown out after a fair trial of some two weeks.

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The undersigned, owners of LESCHOT'S PATENT for DIAMOND POINTED DRILLS, now brought to the highest state of perfection, are prepared to fill orders for the IMPROVED PROSPECTING and TUNNELING DRILLS, with or without power, at short notice, and at reduced prices. Abundant testimony furnished of the great economy and successful working of numerous machines in operation in the quartz and gravel mines on this coast. Circulars forwarded, and full information given upon application.

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J. W. QUICK, MANUFACTURER.



Several first premiums received for Quartz Mill Screens, and Perforated Sheet Metals of every description. I would call special attention to my SLOT CUT and SLOT PUNCHED SCREENS, which are attracting much attention and giving universal satisfaction. This is the only establishment on the coast devoted exclusively to the manufacture of Screens. Mill owners using Battery Screens extensively can contract for large supplies at favorable rates. Orders solicited and promptly attended to.

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## \$1,000 Challenge Ore Feeder.



### HENDY'S \$1,000 CHALLENGE ORE FEEDER.

I call my Automatic Ore Feeder the \$1,000 Challenge, because I challenge the owners or backers of any other feeder to a competitive test for that amount. As Mr. C. G. Rodgers, Superintendent of the Green Mountain mine, near Greenville, Plumas county, appears prominently as a detractor of the merits of my feeder, and seems confident that another one is better, perhaps he will accept this long-standing challenge which the owners of other patents will not, and give me an opportunity to prove publicly the superiority of my machine. As to Mr. Rodgers' assertion about my feeder wearing out, it is no less fallible in that respect than other machinery; but I have over 250 now in use, some of them for over two years, and have never had to expend 25 cents for repairs. The fact that my feeder received the premium at the late Mechanics' fair, and that I am shipping several feeders weekly to different parts of the country, is sufficient proof of the appreciation in which it is held.

As to my feeders having been thrown out of the Gold Strike mill, they were not displaced for inefficiency, as the following letter will show, and it answers also as a complete refutation of Mr. Rodgers' statement:

OFFICE SUPERINTENDENT OF THE GOLD STRIKE G. M. CO.,

GREENVILLE, PLUMAS CO., OCT. 16TH, 1877.

JOSHUA HENDY, Esq.—Dear Sir:—Your favor of the 15th instant at hand. In reply to your inquiry as to the working of your ore feeders at our mill, we can say that there is no fault in the machines, and we consider them the best now in use. At present they are not in use with us, owing to the construction of the mill, which we are about to rebuild and make proper arrangements for putting in your feeders.

J. K. OWEN,

Superintendent Gold Strike Mine.

One of the principal owners of the Gold Strike and Green Mountain mills is also largely interested in the Plumas National mine, where I have just shipped several feeders, showing the confidence placed in the machine by these gentlemen who have used it.

Now, if Mr. Rodgers is sincere in his belief as to the merits of a rival machine over mine, here is a chance for him to make a thousand dollars easily, if he can get the owners of the machine to lend him one for the trial, which is the only doubtful thing in connection with the matter. Mr. Rodgers' eight months' experience with both machines ought to give him confidence enough in his own convictions to accept the challenge offered to him, or any one else.

JOSHUA HENDY.

Corner Fremont and Market Streets, San Francisco.

It may be considered as now fully demonstrated, by careful and long-continued experimentation, that the plan upon which a perfect ore feeder must be constructed is that of the carrier, and not that of the shaking table. Uniform and accurate feeding is not possible upon the latter plan. The ore must be evenly carried, upon a steadily advancing plane or table, to the line of discharge, and there simply dropped. Spasmodic or jerky contrivances will not answer the purpose.

We warrant the machines to give perfect satisfaction, and to be a better and more durable Feeder than any other the market, and will sell them as cheap as any other of its class.

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Silver King Mining Company, Arizona.  
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Crescent Mine, Plumas County, Cal.  
Hidden Treasure, Deadwood, Black Hills.  
S. B. Schronitz, Del Norte, Colorado.  
Little Anna Mine, Colorado.  
Briggs Bro., Black Hanker, Colorado.  
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Julian Mill, Newcastle, Placer County, Cal.  
St. Patrick Mining Company, New Castle, Placer Co., Cal.  
Bunker Hill Mill, Amador County, Cal.  
Gover Mining Company, Amador County, Cal.  
Talisman Mining Company, Amador County, Cal.  
O. C. Hewitt, Keystone O. M. Co., Amador City, Cal.  
Boston Mill, Gold Hill, Nevada.  
Soulisby Mill, Tuolumne County, Cal.  
California Company, Nevada County, Cal.  
Omaha Gold Mining Company, Grass Valley, Cal.  
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med up as follows:

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and freight) not exceeding \$1,500, for a capacity to roast  
and chloridize twenty tons per day, viz brick work,  
\$1,000, and iron work, including blower, \$500.

Second.—Short time required for erection, viz: 14 days,  
after providing all materials, with a sufficiency of la-  
bor.

Third.—No expensive, heavy or complicated machinery  
being necessary, involving heavy freight to the district  
where it may be required. Brick and clay generally ob-  
tainable on the spot, being the chief materials required  
in its construction.

Fourth.—No skilled labor or technical experience is  
necessary to work it. Two ordinary laborers being suf-  
ficient to attend to it when in full operation.

Fifth.—It does not easily get out of order, and is  
readily repaired by an ordinary mason or blacksmith  
when it does.

Sixth.—The royalty, or license to use it, is exceedingly  
moderate, removing thereby all temptation to evade or  
infringe the patent.

Seventh.—Calculating labor at \$3 per day, and wood at  
\$6 per cord, the cost of roasting is but little over \$1.50  
per ton (ex-salt when chloridized), at these high Califor-  
nia rates for labor and fuel.

One of them is now in the course of erection by the  
Aztec Gold and Silver Mining Company, at their mill in  
the Aztec District, Santa Rita mountains, Southern  
Arizona. At their office, 302 Montgomery Street, rooms  
14 and 15, a model may be seen, and working drawings,  
with all further information necessary to enable any ordi-  
nary mason to construct the furnace, may be obtained  
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COL. J. D. GRAHAM.

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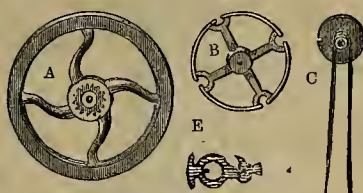
### LATHES,

### SCROLL SAWS,

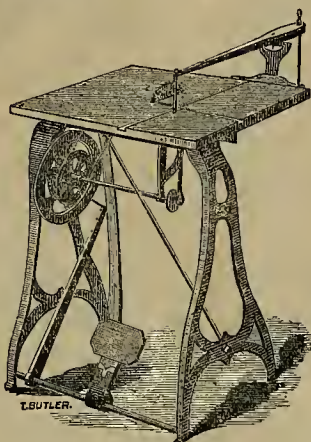
### CIRCULAR SAWS,

### HAND CIRCULAR RIP SAWS,

### And MORTISING MACHINES.

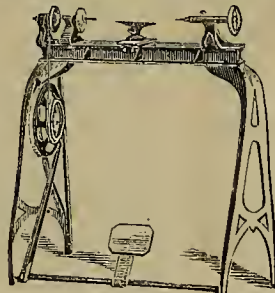


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# MINING AND SCIENTIFIC PRESS.

An Illustrated Journal of Mining, Popular Science and General News.

BY DEWEY & CO.,  
Patent Solicitors.

SAN FRANCISCO, SATURDAY, DECEMBER 1, 1877.

VOLUME XXXV.  
Number 22.

## The Prospector.

[Written for the Press by VOL. U. BILLY.]

Volumes have been written in times past setting forth the claims to public esteem of the numerous heroes of every age and clime. The orators, poets, philanthropists, statesmen, warriors and others who have figured more or less conspicuously in the life drama of nations or localities, and whose deeds or words have been considered of sufficient importance to occupy a place on the pages of history. But there is a class of men whose claims to public attention have hitherto been almost entirely overlooked, and who, although their entrances or exits upon the active scenes of life have never been characterized by that meteoric splendor that is so often seen in the transit across the social firmament of some favored son or daughter of fortune, who, through some great achievement of sword or pen, has excited the admiration of the world, and whose praises have been sung by ten thousand tongues in words of burning eloquence, have by their self-sacrificing perseverance, contributed in no small degree to the wealth of the world and very largely to that of the Pacific coast.

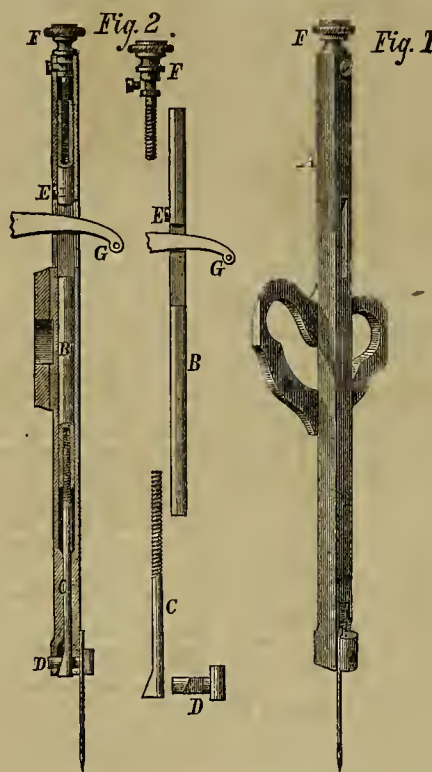
The class of which I speak is the mining prospector, that vanguard of civilization on this coast, who has, for the last 28 years, with steadfast purpose and unfaltering steps, through summer's heat and winter's storms traversed every desert, ascended every mountain and prospected in every stream from Cariboo to Mexico, and from the eastern base of the Rocky mountains to the Pacific ocean; often contesting the ground foot by foot with its savage occupants, sometimes vanquishing and sometimes vanquished. But few, if any, who have never experienced it, can fully realize the hardships and privations that many of them have undergone and are still experiencing in their struggle to gratify their almost insane desire to "strike it rich." The true prospector must have a "well-spring of hope in his soul" for none but those of the most hopeful disposition can long continue in the business under the discouraging disappointments that most of them experience sooner or later. Many of them after long years of unrequited toil in their search for the hidden treasures in nature's storehouse have succumbed to the fatal bullet of the wily savage, the malarious poison of some miasmatic region, or overcome by hunger and fatigue have sunk down to die, "Unwept, unhonored and unsung," on some dreary desert, far from friends and kindred, their golden life-dreams still unrealized. Many of them "have seen better days," having perchance left positions of honor and profit, and inspired with the hope of suddenly acquiring wealth in a manner so strongly tinged with romance have gone forth determined regardless of the many sufferings and dangers to which they were exposed to deserve if they could not win the smiles of fortune's fickle dame.

Some look with scorn and derision upon the prospector and consider him visionary and impractical, profligate and reckless; that there are some such among them none will deny, but many of them are sober, industrious and practical men who have weighed well the chances before embarking in the business. And who will censure them when we see so many who have been raised from poverty to affluence by a "lucky strike." Imagine for a moment the feelings of one who after long years of toil and innumerable disappointments finds himself suddenly lifted from a life of laborious servitude with its thousand ills and inconveniences, to a position of independence, where he can surround himself with the many desirable things which wealth alone can procure; and where he excites the envy of the grovelling, unambitious plodder who looks to-day with a frowning sneer upon the prospector who has returned from an unsuccessful search after the coveted treasure; but to-morrow views him with envious admiration when, perchance, well merited but long deferred success has crowned his efforts.

On the other hand let us imagine the feeling of one of an extremely hopeful and sensitive nature, who after months or perhaps years of labor spent in prospecting in a direction where

the indications gave him every reason to hope for a most gratifying success, possibly in some remote and unfrequented region, finds himself "dead broke," with dispelled hopes sitting lonely and dejected on the bank of some mountain stream, reflecting on the uncertainty of human events, and fully realizing the fact that "man proposes but God disposes." And thinking of the happier scenes of "by gone days,"

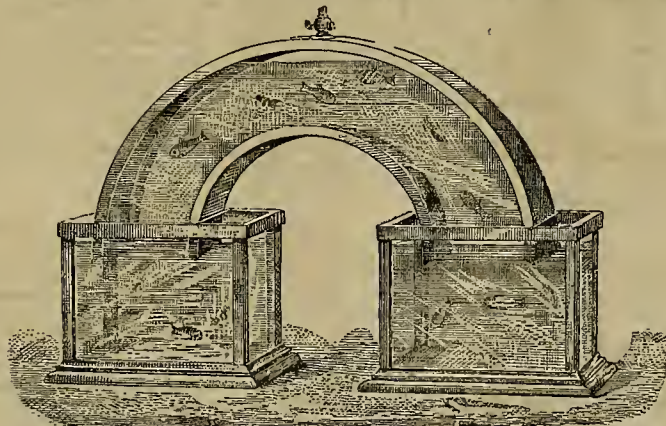
To these restless, unsatisfied nomads the country is indebted for the discovery of nearly all the valuable mineral deposits which have in the last 28 years contributed in so marked a degree to the wealth of the nation and the world. When we reflect upon the vast amount of wealth that is being annually taken from the mines on this coast and put into circulation, the almost countless number of men to whom it,



MORTON'S IMPROVED NEEDLE CLAMP.

before the restless demon, ambition, took possession of his soul; he reluctantly comes to the conclusion that "what fates decree that man must needs abide," and retires to his meager couch to seek therein temporary oblivion.

both directly and indirectly, gives employment, the stimulus it has given to commerce, and the incalculable benefit this great specie-producing region was to the nation in its recent terrible struggle for existence, and the resulting finan-



AN IMPROVED ORNAMENTAL AQUARIUM.

But even there the restless brain refuses to be quiet, and carries the weary dreamer on the wings of imagination to scenes of splendor, where science vies with art in contributing to the wants and wishes of those who worship at mammon's shrine, and he, for the time imagines himself a "bonanza king," before whom all the lesser lights in the financial firmament bow with a flattering obsequiousness; but he awakes in the morning with a headache, and "stubborn facts and stern realities" staring him in the face.

cial crisis, we have but a faint conception of the magnitude of the benefits flowing from the labors of these unappreciated men, of whom so many people, with little wisdom and less reflection, speak in tones akin to contempt. Therefore I say all honor and praise to those adventurous sons of toil, who, unsatisfied with the slower methods of courting the fickle dame, attempt to win her smiles by the less certain but more romantic and exciting avocation of a Prospector.

Kernville, Kern Co., Cal., Nov. 18th, 1877.

## An Ornamental Aquarium.

We illustrate herewith a new aquarium, patented through the MINING AND SCIENTIFIC PRESS Patent Agency, by Matthew Palen and Daniel Sexton, of San Bernardino. The invention consists in constructing an aquarium in such a manner that a portion of the water can be raised into a chamber or chambers which extend above the level of the water in the main tank or tanks, and sustained there by atmospheric pressure, so that the fish can pass from the main tank into the elevated chamber and back again.

The invention can be applied in a variety of ways, so as to produce mysterious and illusory effects.

That which is the most common so far is represented in the engraving. It represents two reservoirs or vessels of an aquarium, set a short distance apart. An arched or siphon-shaped chamber, the sides of which are made of glass and the ends open, form these reservoirs together in the manner of a bridge. The open ends terminate in the tanks. In the top of this arched chamber is placed a valve at the highest point, and means are provided for attaching a single air-pump over it, so that when sufficient water is admitted to the two tanks the air in the chamber is exhausted through the valve, so that the atmospheric pressure on the water in the tanks forces it up into the curved chamber. This pump is then removed and a perfect semi-circular column of water will be maintained in the arch, into and through which the fish can pass from one reservoir to the other, producing a peculiar and interesting effect.

This same device can be used in a single tank if desired, the only necessity being that the open ends of the curved or other shaped chambers be submerged below the surface of the water in the tank. This column of water will thus be maintained for a long time, and when fresh water is supplied to either tank, a circulation will be established through the arched chamber, which will keep it fresh.

A very pretty combination of an aquarium and bird cage is formed, which we will describe in a future issue. A handsome aquarium can be made by this ingenious application of philosophical principles, and a variety of forms can be manufactured.

The invention can be applied in this and various other ways, so as to give peculiar and apparently mysterious effects. Parties wishing the rights to this invention can get them very reasonably by addressing Dewey & Co., 202 Sansome street, San Francisco, or the above-named inventors. Some excellent samples can be seen at Hermann & Co., 630 Washington street, San Francisco.

## Improved Needle Clamp.

We illustrate on this page an improved needle clamp for sewing machines, invented by Joseph V. Morton, Winchester, Clark county, Kentucky.

A, Fig. 1, is the needle-bar, which is boxed longitudinally to receive the rods B and C, Fig. 2. On the lower end of rod C is a wedge-shaped projection, which is fitted in a slot in the bolt D, said slot being widest at its lower side. The bolt, D, has a head, and cuts a hole horsed transversely through the lower end of the needle-bar. The rod, C, screws into the rod, B, which is of larger diameter, and is provided with a screw, E, which passes through a slot in the needle bar, to prevent it from turning. F is a milled screw that engages a thread cut in the upper end of the rod, B, and which is designed to draw the rods, B and C, upward in the bar. The check lever, G, passes through a slot in the needle-bar and rod, B, and is regulated by screwing the rod, C, more or less into B. The operation of clamping the needle consists in placing it under the head of the bolt, D, and in turning the screw, F, until said head is drawn by the action of the wedge against the needle with sufficient force to retain it.



## CORRESPONDENCE.

It is the desire of the editors of this journal to be liberal toward all correspondents, and therefore statements and opinions are frequently published on the authority of the writers, for which we do not assume responsibility.

### Mechanical Ore Concentration.

Remarks by Mr. Cazin on Mr. Rueger's "Philosophy of the Hendy Concentrator."

EDITORS PRESS.—Mr. Chas. C. Rueger, M. E., who has served the cause of mechanical ore concentration before this by his able translation of E. Heherle's description of the mineral dressing works at Falun, Sweden, again serves the same cause well by his able paper in your journal, on the "Philosophy of the Hendy Concentrator." I would have more willingly left this exposition of principles to do all the good it possibly could, than to express what may appear as a contradiction or modification, had not Mr. Rueger, after quoting my name, called in so pointed a way at the beginning and at the end of his paper for discussion and criticism, that to remain silent would have to be interpreted as giving full consent in all points.

My chief reason for reluctance against weakening any thing said in favor of Mr. Joshua Hendy's concentrator by any remarks of mine, consists in a recognition of Mr. Hendy as one of the most active and most persevering pioneers of mechanical ore concentration on the Pacific coast, and I have always regretted that a man of his energy spent all his endeavors on one machine, because it bears his name and is his invention. If Mr. Hendy instead, had elevated his views and himself to a position high enough to look over all that has been done, and what is done at present in his field of action, he would certainly have clearly distinguished not only what merits his concentrator has but also the merits of other machines, and would thus have assisted in introducing each for its proper action and purpose, and instead of being the priest of one idol, he would have been the priest of a principle and an art and have done immense good to the cause he works for. And to do so it is not too late. Sanluis may turn Paulus and make himself the general introducer of an art or science, which, by small and large contrivances of the most manifold forms, one day will become the means by which a large amount of wealth is daily saved, which at present either runs to waste or is neglected altogether.

As meritorious as Mr. Chas. C. Rueger's paper is in one way, by elucidating principles in the main correct, as pernicious it is in the other way in fostering that inclination of considering single and special machines as a panacea for more than one purpose. If we hold review among the machinery applied in any one trade and search into the history of such machinery, we will in all trades soon discover two distinct classes, viz., one of successful, permanent machinery and another of sporadic application; and in entering on the details of each class, we will find that they again resolve themselves into two different classes as to details of construction as well as of action. Those which become standard and permanent are, in their action as well as in their construction, simple, compact and easily understood by the common mind without necessitating extensive elucidation of principles. Those which are short lived and of sporadic application are in their action as well as in their construction complicated, attempting not one simple action but a number of actions simultaneously, which, in order to well fit one in the other, require the presence of numerous indispensable conditions. It is peculiar to such machines that in the hands of the inventor they work successfully, but, when changing hands, they soon are thrown out on account of giving too much trouble.

The adventurer, who saw the same machine work like a charm under the hands of the inventor and who thus knows that the machine does perform the work desired, will throw it out, nevertheless, because the most essential part of the working is the inventor himself, who cannot be purchased, and, if he leaves it, unskilled hands and even skilled hands are at a loss to make it work satisfactorily.

He who has experience in the working of ore concentration works, whether the material be crude ore or tailings, knows of what an immense importance it is, in order to make the works not only technically but also financially a success, that all and every apparatus should permanently, persistently and smoothly do its work, and that the apparatus admits of easy regulation and even repair during a run. As a natural result of this knowledge, complicated contrivances hold their place only for a limited time, and one apparatus intended to do two things at once is soon replaced by two, each doing one thing, but in a sure, easy, intelligible and regulatable way. Mr. C. C. Rueger assures us verbally: "It cannot be denied that the working of the Hendy pan has frequently been unsatisfactory." (Page 268, MINING AND SCIENTIFIC PRESS). This fact being known to me by experience and information, together with the considerations expressed above, were my reasons

for not mentioning Hendy's concentrator in my treatise on mechanical ore concentration and separation, and I indeed believe thereby did such justice to the apparatus as I best judged in the premises. If Mr. Hendy will put his action on a broader basis with regard to these matters, leaving to jigs what belongs to jigs, to classification and seizing what belongs to them, not attempting with it more than his concentrator is good for, he will certainly serve our cause better than by making his apparatus a panacea, and by rejecting such others as for limited action in proper places are by far superior and more reliable, and which will work, once properly started, even under care of unskilled hands. After all, such action would prove more grateful in point of honor and finance to all concerned, and a practice in ore treating would be promoted effectively which must bear one day enormous results to the productiveness of the country.

I do not intend to prolong this letter by entering on the details of principles elucidated by Mr. Rueger, although there are points in which I essentially differ from him, but I beg leave to select a few sentences so as to show how the science of mechanical ore concentration, although first become a science by being based on mathematical calculations, has since emancipated itself with the assistance of independent previous experience, for the nomenclature, with which Rittinger more or less labored it, to such an extent as to pay more attention to practical purposes than to theoretical origin.

Mr. Rueger interprets equal falling as "particles assorted according to their equivalent speed of fall in water." This interpretation is not correct, not even by Rittinger, Mr. Rueger's sole authority, because Rittinger excludes those particles which have equal speed in consequence of equal size and density. But the interpretation is equally incorrect by what the trade has actually adopted. Not the speed is the characteristic distinction, there being an initial speed of particles widely differing even for equal falling particles but the arrival, within the same time at a certain optional depth is the characteristic distinction for equal falling particles. The trade deals with classified (graded) equal falling particles with the understanding that these particles all fell the same distance within the same time, and knows that separation of these may be effected even by changing the falling distance only on account of their speed not being the same at all distances (compare my treatise in the MINING AND SCIENTIFIC PRESS, May 5th, 1877). In such matters professional theory has to submit to governing practice whether it likes or not, especially when common sense is in favor of the laborer and contrary to the scientist. Mr. Rueger further states: "It has been accepted as an axiom—almost in rational concentration, that sizing or grading of the material is absolutely necessary to effect a good separation with any concentrating machine." This is in its generality as expressed, a mistake.

Suppose that the separating medium be of such density as to float the lighter material of two particles to be separated, that is, of a density somewhat higher than that of the (specifically) lighter particle of the two, and at the same time of less density than the (specifically) heavier particle of the two. In such case no sizing would be required, because whatever the comparative size may be, a medium of 2.8 or 3. density will separate quartz of 2.5 density from galena of 7.5 by floating the one and submerging the other. Only when the medium is not of the required density and lacking density has to be replaced by motion imparted to the medium or to the particles, the size and shape of particles becomes of importance, but this importance will decrease in the same degree as the density lacking in the medium is more perfectly supplemented by impulse given to the particles or to the medium in reverse direction one of the other. Therefore the "axiom" spoken of by Mr. Rueger is not the general one he represents it to be, although it is such for all successful apparatuses in actual use, as they all manage the application of power to be the minimum required for the results desired, and not a surplus, which could be avoided by previous sizing or classification, and by a division of action.

F. M. F. CAZIN, M. and C. E.  
Bernallillo, New Mexico, Nov. 13th.

### Globe District, Arizona.

EDITORS PRESS:—In treating of Globe mining district in this letter, I wish to say to those who have been there that I refer mainly to that portion of it which lies between Globe City and an easterly line, drawn between the Blue Bird lode, past the Miama to the Byron and Bixby mines, near the westerly end of the San Carlos Indian reservation. This line does not cross the mineral belt at right angles to the general strike of the lodes. To do that it would have to be run about southeast. The extent of country referred to is some seven miles in length by six in width. As the district is said to be 20 miles long by 12 wide, it is plain that I have only seen a little more than one-sixth of the whole. Why it should be so large and why prospectors should have to come 20 miles to make a record of a claim, I know not. It is true that a lode in an outlying section will derive some advantage from its being ranked with the Globe district mines, but sooner or

later there will be new districts organized out of portions of the old.

### Appearance of the Country.

In central and eastern Nevada, as is well known, there are ranges of mountains, five to 12 miles wide, bearing northerly and southerly, and valleys of about the same width intervening. Here there are no such regular ranges. The Pinal mountains, about eight miles south of Globe City, seem to run nearly east and west, and a group of prominent hills between the Richmond basin and the Stonewall Jackson mine have a northwesterly and southeasterly course. The region I am referring to, however, consists of either low, round or elongated hills, with here and there an iron-capped peak, high enough to show from its summit the billowy-looking character of the lower-lying general surface. Except Pinal creek, above and below Globe City, with a mean course for a number of miles something west of north and east of south, there are no real ravines, only gulches and "dry washes," such as cloud-bursts and the rains of thousands of years have gradually excavated. The hills are mostly covered with a rank unpastured crop of perfectly preserved bunch-grass. If water was abundant there would be no limit to the stock-raising capabilities of this portion of the Territory, but the drouth of the past season leaves only a dry hollow where water used to be. A Nevada explorer finds the other vegetation of the district rather different from that he has been used to. For a day or two at the first he does not keep as far from the bayonet cactus as he learns to do after getting a few irritating stabs. He sees fluted and prickly cactus trees on almost every slope, and occasionally he comes on the mescal cactus, from which the Indians get an eatable saccharine bulb as large as a cabbage. It is stated that the plant takes seven years to come to this maturity, preparatory to putting forth its seed stalk, and it is watched from year to year until its time has come. When baked in a sort of kiln heap, I can say that it makes a toothsome, palatable food. The sage brush of the Silver State has disappeared here with the exception of a little white sage, and in its place comes a shrub called the cat's-claw. As its name implies it is given to scratching. Its only redeeming quality that I know of is that when it is dead and its claws departed it makes a fine camp-fire fuel.

### The Country Rock and Lodes.

There is no limit in these hills to the variety of formation. One finds granite, syenite, porphyry, quartzite, slate or shale and limestone of constantly varying grain, color and density. A hill of lightish color is found, on close inspection, to be of fine-grained quartzite with reefs of limestone passing through it and showing silver or copper lodes near the line of contact, with the former as the footwall rock. Another hill with a reddish hue is seen to be of similar quartzite, traversed by slaty belts, and alongside of rich silver lodes a coarse sandstone-looking red quartz is exposed—not ore itself but close to the ore. Then there are dark gray quartzites of a coarse fracture, which can be dug out in square pieces, fit to put into a wall. Through these are seen great lodes of iron rock, running from north 20° east to northeast and the same west to southwest. Sometimes good ore is found alongside of these reefs, but generally they are not attractive to the prospector. The most promising granite formation I have seen is in the direction of the Silver Bell or Kentuck mine, extending on to the southwest past the Monitor and Casket locations, including also the Orion ground. It is a soft granite, resembling that of Lander hill, near Austin, and shows very little iron adjoining the veins. The lodes at this point are from one and a half to five feet wide and promise to make good permanent paying mines. Veins of black and brown spar are found, but such as I noticed were barren. As a rule it appears that copper predominates in syenitic rock, but it is also abundant and rich in other formations. In the lighter colored soft granites I have only seen it once or twice. There are no very rich silver ores in the part of the district I am dealing with, except in the Byron and Bixby mines, and these are very fine, but the lodes generally are of a good size, regular in their course northeasterly and southwesterly and, under development, likely to yield paying quantities of \$100 to \$200 ore.

### Copper Mines.

Next to Globe City there are many promising copper lodes. The Globe mine, located when the Apaches were dangerous, is a lode of great size, showing one chimney of 25 to 50 per cent. ore, which contains, I am told, considerable silver and gold. Its course is northeast and southwest, with an easterly pitch. The footwall rock is porphyritic, very similar to that in which the Silver King mine in Pioneer district is found, the hanging wall rock being limestone with a narrow belt of shale between. The Cadmus mine, now being opened by a San Francisco company, is a strong, fine looking lode, traceable for a long distance. The ore, it is affirmed, yields considerable silver, which increases as depth is attained. Some of the copper veins are capped over with massive bodies of reddish-brown iron rock, and often quite near to them there are deposits of rich hematite. Only traces of silver are found in most of these ores, but in one case I have heard of, high-grade copper ore on the surface gave place to iron 20 feet down, and this to silver ore a few feet farther. The worst thing about these cupreous ores containing silver will be the impossibility of either successfully amalgamating or smelting

them, but when the railroad comes within 30 miles, their value as shipping ores will be enhanced. One or two attempts at reducing copper ores here have been made in the district, but failed because the product could not be sold in San Francisco at a remunerative price.

### Ores and Quartz Mills.

Nearly all the ores I have noticed will require roasting—at least as soon as the mines are opened a few feet below the surface. There are no large bodies of pay ore in sight. The lodes must be developed before quantities can be depended on, and when that is done there will be plenty of work here for many well equipped quartz mills. The Champion mill, 12 miles distant, has been in successful operation for sometime, but I learn that furnaces are to be erected. The Miama 10-stamp mill, six miles off, will be completed in two weeks. Its furnaces are reverberatory four in one range, with but one grate-bar for all. An old Austin ore-roaster would not like furnaces of this sort, but they may be good notwithstanding. The arches and fire-bridge are of adobes, and I fear they will soon burn out. The Miama mine has a good body of surface ore, but is not much opened. Like the mines of Lander and Ruby bills, in Nevada, it is "faulted," but as the vein can easily be found again that ought not to occasion any serious discouragement to the owners.

### Water and Firewood, etc.

There is a stream of water flowing down Pinal creek 15 to 20 feet below the surface. An inexhaustible supply is found in shallow wells, and at the Wheatfields, several miles down the ravine, the stream comes to the surface. Water is obtained in several other places in springs and 20-foot wells, but probably the southwestern half of the district will rely on Pinal creek as the place for mill sites. The scattered patches of pine, cedar, mesquite and hackberry found along the mineral belt will last for several years, the price per cord not exceeding, perhaps, \$5 to \$7. The wooded range 8 to 15 miles off, will furnish lumber, timber and firewood for many years, after which other supplies are sure to be forthcoming if the mines prove good. The distance of the northeastern part of the district from the timber range places it at a disadvantage, but, judging by the yield of the Stonewall Jackson mine and others in that locality, the extra richness of the ore will more than make up for this drawback. Lumber of rather poor quality is at present \$100 per thousand—firewood, \$5.

### Notes.

The weather is very pleasant, though somewhat cold at night. We have had a little ice several times. The magnet of attraction in the district seems to be in the vicinity of the McMillan camp, 19 miles north of this place. I am going over there in a day or two, and will be able, by and by, to give your readers my impressions of that locality.

For the benefit of those men who have neither means nor influence, but who hope to find a rich lode any forenoon, if they could once reach this place, I may add that I have not come as yet upon a single claim where the individual owner is extracting pay ore that will yield him wages. In other sections I understand that it is different, though the "poor man's" mines, I am inclined to believe, are not lying around loose in any great numbers. But as a place for capitalists to make money by judicious investments, this surpasses all the districts I have ever been in.

J. D. E.  
Globe City, Arizona Terr., Nov. 10th, 1877.

THE PECK MINING COMPANY.—At a meeting of the stockholders of the Peck mining company held on the 20th inst., the following named gentlemen were elected a Board of Directors: E. G. Peck, Wm. Sherman, L. B. Jewell, C. C. Bean, J. C. Stebbins, J. F. Place and W. S. Hobart. At a subsequent meeting of the Directors E. G. Peck was elected President, J. F. Place, Vice President, and L. B. Jewell, Secretary. The Peck mine is reported to be one of the richest in Arizona. Located near Prescott, it is one of the few discovered in that Territory which have yet developed a well defined ledge for over 300 feet in depth. It has been worked by Mr. Peck and his associates for the past year under an Arizona incorporation and has paid from the start; the company, with a small mill, located 30 miles from the mine, having turned out about \$400,000 in silver bullion in about 18 months. The Arizona company has recently deeded the property to the new Peck mining company (incorporated under the laws of California), the organization of which is given above. The company has recently bought a new 10-stamp mill, which is now being erected, and which will be turning out bullion within 30 days. It is then confidently expected by the owners that the production will come well up to \$100,000 a month.

WASTAGE FROM A MINE.—On the 27th of January, 1874, L. L. Robinson and William T. Coleman brought suit in the Fifteenth District court against the Black Diamond Coal Company for \$25,000 damages, the complaint being that plaintiffs are the owners of the Los Medanos rancho, Contra Costa county. The defendant allowed a large quantity of debris of his mine, and sand, clay and other refuse matter, to be floated over plaintiffs' land, mixed with water, to the depth of a foot or more, rendering those portions over which it spread incapable of profitably producing vegetation. Judge Dwinelle has given the plaintiff a verdict for \$5,500.



## MECHANICAL PROGRESS.

## A Model Station House.

AN exchange contains the following description of a new station house on the line of the New Jersey division of the Pennsylvania railroad, at Rahway, New Jersey; the writer commending it as a model for western railways to copy from: The station is of brick, in one story and an attic, exteriorly cross-shaped, the long side of the cross along the tracks, and the roof as wide as the transepts of the cross. There are belt courses in the brick, made of experimental tiles, some set in hollow or sharp-ended. Interiorly there is only one story—the attic windows are upper lights to the beautiful saloons of solid wood. The ceilings, like the sides, are of hard, yellow pine, merely varnished. The doors are of hard ash. The seats, which everywhere surround the two saloons, are of perforated maple. There are ten tall windows in the main or new saloon, and two double doors, each with a shallow window above it next to the ceiling. There are no end doors. The seats extending all around the saloons have no legs, merely iron stanchions. The interior side of the transepts is made into the ticket office on one side and retiring room on the other. This part of the room reduces the height of the ceiling one-half, or from 22 feet to 11, in the archway of uniform varnished wood. Thus the lower room, only half the size of the public or ticket-seller saloons, is in full view, and one ticket-seller governs both saloons. The floors are of shellacked yellow pine. In both rooms the gas-lights drop by long tubes from the ceiling, and the heaters are in the uncompleted floor. The lounge windows are tall and square, with round, arched sashes. Exteriorly the wood work is in colors—the frames green, the dies white, and the panels brown. The men's room is about 54 feet long; the women's room about 40. This measurement is to the middle of the arch. But to the women's room is added a baggage room, not connected with it, and opening on the railroad platform. The roof ridges are level with each other all over the building; the use of colored tiles is copious; in the exterior beltings of black, and black and gray arch lines, and the frame chords of sub-sheds are braced on mouldings of white cement. The depot within is like being in a fine cigar box, in which are let cross cells for matches. It cost \$15,000, and is the most perfect country station in America.

## Bismuth Bronze.

A correspondent of the London *Mining Journal* gives the formula for compound bismuth bronze, which he believes will be found of wide usefulness to metal workers. The process is invented by Mr. James Webster. Mr. Webster's object is to produce metallic alloys suitable with or without the addition and admixture of other metals or alloys, as required, for the casting of cannon and other large articles, also ingots, slabs and the like for rolling and for general purposes; and for the production of superior alloys for the manufacture of articles usually made of metals or alloys of metals. For making the hard bismuth bronze or alloy, he takes bismuth, 1 part; lead, 3; zinc, 6; nickel, 15; copper, 25; and antimony, 50 parts; melts them in a suitable pot or crucible and at the same time thoroughly amalgamates them, and then runs the amalgam, alloy or bismuth bronze thus produced into molds of any convenient shape or form for future use, as desired. This bismuth bronze is a hard metallic alloy and may be made into reflectors for mirrors, lamps and the like and into other articles requiring a high degree of hardness or polish; also for axle and shaft bearings, valves and for other similar articles or purposes. It may also be ground into bronze powder and be used for similar purposes to those in which ordinary bronze powder has hitherto been applied.

It will, perhaps, be said that an alloy of this kind would be too costly to come into general use, owing to the high percentage of antimony, and I am inclined to think so myself, except for the purpose of bronze powders, but he also proposes a softer bismuth bronze, which would be as cheap as copper and might be advantageously used for a variety of purposes. The softer kind consists of bismuth, 1 part; lead, 5; zinc, 12; nickel, 30; and copper, 52 parts; the amalgamation of the several metals being effected in the same way as in the case of the hard alloy. The latter admixture forms a very tough metallic alloy and is cast into ingots at once, to be afterwards remelted and cast or rolled or otherwise dealt with as required. These alloys will be found to resist oxidation and keep their color better than any other similar alloy hitherto made and can be produced at less cost.

**FEEDING MINE LAMPS WITH COMPRESSED AIR.**—We read in an exchange that an improved safety lamp is at present being manufactured by Mr. A. B. Bouillon, Sr., of Issy-sur-Seine, near Paris, the leading principle of which is that the compressed air which is furnished to the lamp in quantities just sufficient to insure perfect combustion is taken from outside the mine, or at least from a part of the mine which is free from fire-damp. The exterior air is conducted to the lamps inside the mine by means of an iron pipe.

The air so distributed to the lamps is submitted to a variable pressure according as the lamps are placed at a more or less distance from the reservoir of air or from the cisterns, which can be placed at different points in the mine. The principle of the inventor then rests essentially upon the canalization of the exterior air after the manner of the canalization of gas for the lighting of town. This lamp repels on the one side the carbonate hydrogen gas, while at every instant it is purified from the carbonic acid produced from the combustion; solid iron bars protect and enclose it. The wick is fed with oil by the principle of capillarity; it is necessary only to measure the quantity of oil to know the number of hours one wishes the lamp to burn, or to make a bigger lamp. Fixed at different points in the mine it serves the miner with light in every direction by means of a reflector, which can be turned round at will; however, in case of need, the lamp may be carried by an experienced miner, because small vulcanized india-rubber may be affixed to any of the air taps which are placed along the principal tube.

## The Art of the Die Sinker.

When a die is required for a coin or medals, the engraver takes a piece of soft steel of suitable dimensions, generally three or four inches in length, and about an inch greater in diameter than the coin or other article required; on this he hollows out the exact form of the desired impression by cutting away the steel by degrees, with small, well-tempered, case-hardened tools. As soon as this work is thoroughly accomplished the steel is hardened by being heated red-hot in a crucible with charcoal and oil or bone-dust, and then plunged into cold water. When a great number of coins of one sort are required, the original die is termed the matrix, and copies are made from it by taking impressions from it in soft steel, which is in relief, and is called the puncheon, and from which, when it has been hardened, other dies are produced by pressure exactly similar to the matrix, and in *intaglio*, which are case-hardened in their turn before they are fit to transmit an impression to any metal used for money. The metal used for our coinage, whether gold, silver, copper, or bronze, is stamped in a cold and solid state; but medals and emblems can also be produced by a method called casting *en cliche*, in which the metal is used in a soft state. For this purpose an alloy is used, consisting of one-fourth lead, one-fourth tin, and one-half bismuth, which fuses readily at the boiling point, 212° Fah. When the metal is soft, resembling paste in consistency, the die is placed upon it, and the impression produced by a smart blow from a mallet; the surface of the metal sets instantly, from coming into contact with the cold die, and thus readily retains the form that has been given to it. Copies of medals may be readily made in this way, but each face will be obtained in a separate piece, and these must be joined to give representations of the coin in a complete form. Ornamental work is produced in thin metal for gasfitting, cornices, parts of cruet-stands, trays, etc., by means of a pair of dies, on one of which the pattern is formed in relief, and on the other in *intaglio*, the metal being placed between them, and brought into the desired shape by pressure. Dies are also made in metal for forming articles in gutta-percha and leather, and producing embossed figures on the cloth covers of books, as well as on card-board, paper, etc.

**LOCATING AN OBSTRUCTION IN A PNEUMATIC TUBE.**—The French have a very ingenious plan for locating an obstruction, thus overcoming a difficulty in pneumatic transmission that has often been a source of great expense. It appears, when an obstruction exists anywhere in the underground tubes, its location is determined by firing a pistol into the tube; the resulting wave of compressed air, traversing the tube at the rate of 1,000 feet a second, strikes the obstruction, and is then reflected back to its origin, where it strikes against a delicate diaphragm, and its arrival is recorded electrically upon a very sensitive chronograph, on which also the instant of firing the pistol had been duly recorded. The wave of sound, on reaching the diaphragm, is recorded, and thence reflected back, and a second time strikes the obstacle and returns to the diaphragm. This operation is several times repeated, so that several successive measurements can be made of the time required by the sound wave to traverse to and fro within the pneumatic tube.

**A NEW CUPOLA BLOWER.**—The *Annales des Mines* tells of a cupola in the Cleveland district, furnished with air by means of a jet of steam. It is cylindrical, four feet three inches in diameter and 30 feet high, built of refractory brick with a sheet iron casting. The upper part, by means of a horizontal flue, communicates with a sheet iron column descending vertically into the ground, where it joins an underground flue leading to a chimney. A steam pipe of small diameter enters the sheet iron column, the jet of steam causing a current of the air in the cupola, which is furnished with eight tuyeres two feet above the bottom. These tuyeres or openings may be closed at will. The results obtained were satisfactory, five tons of foundry iron being melted in an hour with it, it is claimed, a saving of five per cent. of coke. There are four of these cupolas which four small boilers are found sufficient to supply with steam.

## SCIENTIFIC PROGRESS.

## The Perpetual Forces of Nature.

Mr. Ralph Waldo Emerson, in a paper contributed to the *North American Review*, talks as follows about the perpetual forces of nature: There is no porter like gravitation, who will bring down any weight you cannot carry, and if he wants aid knows how to find his fellow-laborers. Water works in masses, sets his irresistible shoulder to your mill or to your ships, or transports vast boulders of rock neatly packed in his iceberg 1,000 miles. But its far greater power depends on its talent of becoming little, and entering the smallest holes and pores. By this agency, carrying in solution elements needful to every point, the vegetable world exists. Who are the farmers' servants? Who but geology, chemistry, the quarry of the air, the water of the brook, the lightning of the cloud, the plow of the forest? Before he was born into the field, the sun of ages soaked it with light and heat, mellowed his land, decomposed the rocks, covered it with vegetable film, then with forests, and accumulated cubic acres of sphagnum whose decays make the peat of his meadow. The rocks crack like glass by inequality of contraction in heat and cold, and flakes fall constantly into the soil. The tree can draw on the whole air, the whole earth, on all the rolling main. The plant, the tree, is all suction pipe, inhaling from the ground by its roots, from the air by its twigs with all its might. Take up a spadeful or a buck load of loam; who can guess what it holds? But a gardener knows that it is full of peaches, full of oranges, and he drops in a few seeds by way of keys to unlock and combine its virtues—lets it lie in sun and rain, and by and by it has lifted into the air its full weight in golden fruit. What agencies of electricity, gravity, light, affinity, combine to make every plant what it is, and in a manner so quiet that the presence of these tremendous powers is not ordinarily suspected. Faraday said that "a grain of water is known to have electric relations equivalent to a very powerful flash of lightning." The ripe fruit is dropped at last without violence, but the lightning fell and the storm raged, and strata were deposited and upturned and bent back, and chaos moved from beneath to create and favor the fruit on our table to-day. Go out of doors and get the air. Ah, if you knew what was in the air! See what your robust neighbor who never feared to live in it, has got from it—strength, cheerfulness, power to convince, heartiness and equality to each event. As the sea is the receptacle of all rivers, so the air is the receptacle from which all things spring, and into which they all return; an immense distillery, a sharp solvent, drinking the oxygen from plants, carbon from animals, the essence and spirit of every solid on the globe; a menstruum which melts the mountains into it. All the earths are hurst metals. One-half the avoirdupois of the rocks which compose the solid crust of the globe consists of oxygen. The adamant is always passing into smoke; nature turns her capital day by day. All things are flowing, even those that seem immovable. The earth burns, the mountains burn, slower but as incessantly as wood in the fire. The marble column, the brazen statue burn under the daylight, and would soon decompose if their molecular structure, disturbed by the raging sunlight, were not restored by the darkness of night. Plants and animals burn or perpetually exhale their own bodies into the air and earth again. While all thus burns, the universe in a blaze, kindled from the torch of the sun, it needs a perpetual tempering, a phlegm, a sleep, atmospheres of azote, deluges of water, to check the fury of the conflagration; a hoarding to check the spending, a centripetence to the centrifuge. And this is uniformly supplied. Nature is as subtle as she is strong, and like a cautious testator ties up her estate so as not to bestow it all on one generation, but has a fore-looking tenderness and equal regard to the next and the next and the fourth and the fortieth. The winds and the rains come back a thousand and a thousand times. The coal of your grate gives out in decomposing to-day exactly the same amount of light and heat which was taken from the sunshine in its formation in the leaves and boughs of the antediluvian tree. The earliest hymns of the world were hymns to these natural forces. The Vedas of India, which have a date older than Homer, are hymns to the winds, to the clouds and to fire.

**NEED FOR SCIENTIFIC MEN IN THE INDUSTRIES.**—In the course of a recent lecture at Philadelphia, Mr. W. H. Wabl, one of the editors of the *Polytechnic Review*, spoke as follows: We need, imperatively, the educated skill of scientific workmen in every department of technology, men who can rationally direct the tillage of our countless acres of productive soil, and the rational utilization and cultivation of our forests, that the ignorant impoverishment of the former, and the improvident and criminal destruction of the latter, may not, despite the exuberance of Nature's bounty to this, the richest of her continents, cover her face with the widespread desolation that has converted so many of the fairest garden spots of Asia and Europe into arid deserts; men who can direct us how to tap, with the magic wand of science, the rocky ribs of our hillsides and mountains, and force them to disgorge their hidden treasures;

we need designers and constructors, who shall supply to skilled laborers, in other fields of industry, the tools, implements and machinery which will multiply their productive powers a hundred-thousand fold, so that the products of multifarious industries shall be placed within the reach of the humblest and poorest of us. But above all, the preeminent merit of a widely disseminated scientific training will be to inspire men, who comprehend what science has done for civilization, through patient, faithful, unflinching and unselfish labor and study, with a genuine enthusiasm for the pursuit of truth for the truth's sake, with a keen conviction of the dignity of labor, with a thorough hatred of sham and pretense, and keen pleasure in the consciousness of work well done.

**THE STARFISH.**—The *Independent* says that in a richly illustrated volume on the embryology and anatomy of the starfish, Mr. Alexander Agassiz takes exception to the prevailing Darwinian views in the following language: "While," he says, "the successive appearance of the great types of Echini in geological time—in other words, their paleontological development—is in the strictest harmony with what we know of their embryological development, we as certainly know nothing whatever of the causes which have brought about their sequence in time, in such striking agreement with the sequence in their phases of growth. The case of successive modifications of the ancestral horse, which has so often been brought forward as conclusive regarding the genealogy of the group, although more familiar, is far less complete and much more limited in time than the succession to be traced from the paleontological evidence of Echini. But, while natural selection gives a plausible explanation of like problems among vertebrates, it fails utterly when applied to the majority of the invertebrates, and we have completely failed, thus far, to find any causes for their paleontological development differing from those acting upon their successive embryological stages at the present day, of which we know absolutely nothing."

**COAL AND IRON IN INDIA.**—Mr. Walter Ness, who is under an engagement by the British government to develop the Warora coal fields of Central India, states that in the Warora coal fields there are by computation, 500,000,000 tons of coal within 14 miles. The coal consisted mainly of an 11-foot seam, but owing to the difficulty of native labor, it had to be worked by the long-wall system. It took three or four natives to do the same amount of work done by one English miner. He had some trouble in training the natives to work in the pits, and also as blacksmiths and carpenters, but afterwards they gave him little trouble, as they were amenable to law and order. About 50 miles from where he was engaged in the development of the coal field, there was a hill with a rich vein of ironstone, and he calculated that it contained 3,000,000 tons of rich ore. He hoped that the time would soon come when the seam would be worked, and iron made in India. He said the coal was not faulty, and he had not seen any gas. All the coal raised at present is used for locomotive purposes. The price is 12 shillings per ton, but this would be reduced when the coal could be worked by skilled workmen.

**GEOLOGICAL SURVEY OF BRAZIL.**—Among the more important results so far accomplished by the geological survey of Brazil, says the *Engineer*, has been the discovery of the existence in Brazil, of the silurian, Devonian, carboniferous, triassic, Jurassic, cretaceous and post-tertiary formations, all of them furnishing well-characterized fossils in great variety, and of which large numbers have been collected by the commission for its investigation, and for the purpose of distribution in Brazil and of exchange with foreign establishments. So far no well-defined tertiary has been found to exist in Brazil. The survey has also been very successful in its ethnological researches, especially among the kitchen-middens of Santa Catharina, Parana, San Paulo, Bahia, and the Amazonas, the results of which have been announced in part, although much of interest yet remains to be published. The researches in the coral reefs have been made the occasion of securing numbers of marine animals, all of which add to the resources of the survey.

**VELOCITY OF VIBRATIONS IN EARTH.**—Gen. H. L. Abbot gives an account of his series of experiments to test the rate at which tremors from explosions are transmitted through the earth. He stated that for one mile through drift formation a severe shock gives a velocity of about 8,500 feet per second. The rate for the great Hallett's Point (Hell Gate) explosion was about 8,300 feet per second for the first eight miles and about 5,300 feet per second for the first 13 miles. These estimates enormously exceed those reported by Mr. Mallet some years ago to the Royal Society, the highest velocities obtained by him being not over a third of the lowest and a fifth of the highest noted by Gen. Abbot.

**DUST FROM HIGH ALTITUDES.**—M. Gaston Tissandier and his brother, says *Nature*, have made an ascent from Giffard's aeronautical works, for the purpose of collecting the dust floating in the atmosphere. The method employed has been to condense the moisture of the air and analyze the water and ice thus obtained with a microscope.



## Table of Highest and Lowest Sales in S. F. Stock Exchange.

Name of Company.	Week Ending Nov. 8.	Week Ending Nov. 15.	Week Ending Nov. 22.	Week Ending Nov. 29.
Alpha.....	111	103	137	114
Alta.....	80c	60c	65c	1 1/2
Baltimore Con.....	54	44	54	5
Belcher.....	18	15	23	17
Belmont.....	6	4	6	5
Best & Belcher.....	2.60	2.20	4.00	2.60
Bullion.....	27	26	30	27
California.....	33	29	36	33
Challenge.....	51	5	5	5
Chlorine.....	51	5	5	5
Con Imperial.....	51	5	5	5
Con Virginia.....	27	23	28	24
Crown Point.....	51	4	6	5
Crowns.....	51	5	5	5
Dayton.....	45c	30c	45c	25c
Eureka Con.....	45c	44c	45c	44c
Exchequer.....	4.50	4.30	5	5
Fidelity & Bond.....	13	12	13	11
Grand Prize.....	13	12	13	11
Globe Con.....	13	12	13	11
Golden Ohio.....	45c	25c	75c	90c
Gould & Curry.....	8	7	10	8
Hale & Norcross.....	7	6	7	5
Hussey.....	2	2	2	2
Julia.....	9	8	13	9
Justice.....	4	2	4	3
Kentucky.....	2	2	2	2
Kentuck.....	2	2	2	2
Kosuth.....	25c	20c	25c	20c
Lady Bryan.....	4	4	4	4
Lady Wash.....	4	4	4	4
Leopard.....	40c	35c	50c	40c
Leviathan.....	40c	35c	50c	40c
Leeds.....	2	2	2	2
Modoc.....	1.35	90c	1.15	90c
Manhattan.....	101	101	101	101
Meadow Valley.....	25c	25c	25c	25c
Mexican.....	111	81	111	111
North Con Virginia.....	60c	25c	45c	50c
New York.....	60c	25c	45c	50c
Niagara.....	152	141	152	141
Northern Belle.....	152	141	152	141
New Coso.....	60c	50c	70c	55c
Ophir.....	200	128	44	26
Overman.....	152	141	241	163
Pacifico.....	50c	40c	9	8
Phil Sheridan.....	60c	50c	1	90c
Phisher.....	50c	40c	9	8
Prospect.....	70c	60c	9	8
Raymond & Ely.....	70c	60c	9	8
Rock Island.....	40c	20c	25c	20c
Sage.....	31	30	34	37
Seg Belcher.....	31	30	34	37
Sierra Nevada.....	4	3	5	4
Silver Hill.....	2	1.80	2	3
South Charlot.....	3	2.90	4	3
Succor.....	1	1.20	1.40	1.55
Trojan.....	7	5	6	7
Union Con.....	14	12	15	11
Utah.....	80c	65c	1.30	80c
Woodville.....	9	8	12	9
Yellow Jacket.....	8	8	12	9

## Sales at S. F. Stock Exchange.

Friday A. M. Nov. 23.	745 Crown Point.....	64c	64c
45c Alpha.....	12c	12c	12c
1130 Alta.....	11c	11c	11c
375 Best & Belcher.....	2.60	2.20	4.00
60c Belcher.....	60c	60c	60c
1450 Bullion.....	64c	64c	64c
1700 Chollar.....	35c	35c	35c
1310 Chollar.....	25c	25c	25c
1575 Crown Point.....	60c	60c	60c
5770 Con Imperial.....	1.10	1.10	1.10
1115 Caledonia.....	4.00	4.00	4.00
1000 Dana.....	100	100	100
910 Exchequer.....	4.70	4.00	4.00
1575 Gould & Curry.....	3.00	3.00	3.00
500 Hale & Nor.....	80c	80c	80c
800 Justice.....	11c	11c	11c
40 Julia.....	2	2	2
280 Kentucky.....	5	5	5
2040 Mexican.....	14c	14c	14c
6160 Ophir.....	47c	47c	47c
230 Overman.....	152	152	152
220 Succor.....	34	34	34
700 Savage.....	9c	9c	9c
1045 Sierra Nevada.....	60c	60c	60c
115 Seg Belcher.....	37c	37c	37c
600 Union Con.....	14c	14c	14c
204 Utah.....	14c	14c	14c
2705 Yellow Jacket.....	12c	12c	12c
AFTERNOON SESSION.			
100 Argentina.....	1.40	1.40	1.40
75 Alps.....	5	5	5
60 Andes.....	80c	80c	80c
50 Boyle.....	50c	50c	50c
3200 Benton.....	2.50	2.50	2.50
150 Baltimore Con.....	14c	14c	14c
1240 Best & Belcher.....	2.10	2.10	2.10
1310 California.....	2.00	2.00	2.00
100 Challenge.....	1.15	1.15	1.15
170 Day.....	15	15	15
2180 DeFrees.....	60c	60c	60c
150 Dayton.....	40c	40c	40c
355 Eureka Con.....	38c	38c	38c
715 Grand Prize.....	12c	12c	12c
515 Gila.....	10c	10c	10c
2525 Gould & Curry.....	10c	10c	10c
1150 Golden Chariot.....	1.20	1.20	1.20
1100 Independent.....	1.10	1.10	1.10
100 Jackson.....	60c	60c	60c
400 Joe Scates.....	25c	25c	25c
300 Kosuth.....	25c	25c	25c
180 Leopard.....	13c	13c	13c
385 Leeds.....	13c	13c	13c
320 Lady Wash.....	12c	12c	12c
900 Leviathan.....	60c	60c	60c
725 Modoc.....	60c	60c	60c
45 Manhattan.....	11c	11c	11c
300 Meadow Valley.....	25c	25c	25c
2505 Mexican.....	75c	75c	75c
150 Northern Belle.....	14c	14c	14c
725 New York.....	14c	14c	14c
320 New Coso.....	50c	50c	50c
320 Navajo.....	20c	20c	20c
100 North Carson.....	25c	25c	25c
750 North Con Vir.....	70c	70c	70c
500 Ophir.....	51c	51c	51c
100 Occidental.....	1.20	1.20	1.20
300 Pawnee.....	25c	25c	25c
300 Rock Island.....	25c	25c	25c
1535 Silver Hill.....	3.00	3.00	3.00
65 Solid Silver.....	1.70	1.70	1.70
350 Senator.....	49c	49c	49c
175 Star.....	3.40	3.40	3.40
1475 Sierra Nevada.....	60c	60c	60c
100 South Justice.....	1.10	1.10	1.10
1600 St Louis.....	40c	40c	40c
250 Savage.....	21c	21c	21c
350 Trojan.....	1.15	1.15	1.15
400 Trojant.....	1.10	1.10	1.10
825 Woodville.....	1.40	1.40	1.40
270 Ward.....	1.60	1.60	1.60
200 Young America.....	50c	50c	50c
1755 Yellow Jacket.....	13c	13c	13c
Saturday A. M. Nov. 24.			
1000 Argenta.....	1.25	1.25	1.25
1310 Alta.....	12c	12c	12c
2075 Alta.....	17c	17c	17c
100 Alps.....	5c	5c	5c
2010 Belcher.....	64c	64c	64c
355 Bullion.....	64c	64c	64c
100 Boyle.....	50c	50c	50c
955 Best & Belcher.....	2.10	2.10	2.10
1010 California.....	2.00	2.00	2.00
1500 Con Virginia.....	2.50	2.50	2.50
300 Chollar.....	34c	34c	34c

100 Grand Prize W.....	1	80 Utah.....	14
110 Hussey.....	30c	1870 Yellow Jacket.....	12c
650 Independent.....	1.35	AFTERNOON SESSION.	
680 Joe Scates.....	40c	630 Andes.....	75c
530 Jackson.....	25c	345 Alta.....	18c
1700 Justice.....	12c	340 Alps.....	5c
300 Kosuth.....	25c	300 Argentina.....	1.65
420 Leviathan.....	60c	350 American Flat.....	1.10
400 Lee.....	45c	35c Bodie.....	1.10
270 Leopard.....	11c	300 Boyle.....	18c
80 Lady Wash.....	11c	85 Best & Belcher.....	2.00
330 Modoc.....	55c	50 Belmont.....	50c
635 Mexican.....	14c	630 Belcher.....	64c
1100 Meadow Valley.....	15c	1200 Benton.....	2.00
1700 Navajo.....	20c	635 Con Virginia.....	2.50
380 North Con Vir.....	1.10	300 California.....	2.00
535 Northern Belle.....	14c	250 Crown Point.....	6
150 New Coso.....	50c	500 Caledonia.....	4.00
2250 New York.....	14c	100 Challenge.....	1.10
500 North Carson.....	1.05	150c DeFrees.....	70c
2135 Ophir.....	42c	240 Day.....	44c
90 Overman.....	23c	50 Dayton.....	40c
50 Occidental.....	1.20	45 Eureka Con.....	38c
140 Gould & Curry.....	3	140 Gold & Curry.....	3
30 Rye Patch.....	31c	315 Grand Prize.....	12c
400 Rock Island.....	25c	100 Gila.....	10c
25 Silver King.....	15c	100 Gen Thomas.....	30c
300 Solid Silver.....	1.70	1145 Hale & Nor.....	9c
490 Star.....	37c	1145 Hale & Nor.....	9c
860 St Louis.....	40c	725 Independent.....	1.15
220 Silver Hill.....	3.20	120 Jackson.....	3.10
200 Senator.....	43c	430 Justice.....	12c
100 Joe Scates.....	1	800 Kosuth.....	30c
200 Tuscara.....	1	100 Leeds.....	30c
25 Trojan.....	1.70	100 Leopold.....	14c
400 Trojant.....	1.10	250 Leopard.....	14c
250 Ward.....	1.60	100 Leviathan.....	60c
255 Woodville.....	1.30	100 Leys.....	60c
495 Yellow Jacket.....	13c	40 Lady Wash.....	9c
Tuesday A. M. Nov. 27.			
245 Alpha.....	13c	1375 Modoc.....	14c
1385 Alta.....	15c	1300 Meadow Valley.....	20c
725 Bullion.....	64c	100 Northern Belle.....	14c
315 Best & Belcher.....	2.10	1025 North Con Vir.....	1.10
5737 Con Imperial.....	1.10	320 Navajo.....	20c
625 Crown Point.....	64c	635 Con Virginia.....	2.50
528 Con Virginia.....	2.50	1015 Ophir.....	42c
743 California.....	2.00	380 Overman.....	23c
1320 Caledonia.....	3.50	95 Raymond & Ely.....	70c
140 Chollar.....	34c	50 Rye Patch.....	31c
30 Confidence.....	55c	50 Rock Island.....	25c
2500 Dana.....	60c	50 Silver King.....	15c
50 Dayton.....	40c	1065 Star.....	37c
965 Exchequer.....	4.50	50 Senator.....	31c
40 Gould & Curry.....	3	100 South Justice.....	1.10
1170 Hale & Nor.....	9c	20 Seg Belcher.....	40c
1485 Justice.....	12c	120 St Louis.....	40c
765 Julia.....	2.00	1085 Silver Hill.....	3.10
300 Kentucky.....	5	1270 Trojan.....	1.15
920 Mexican.....	15c	100 Solid Silver.....	1.70
600 Overman.....	23c	100 Tip-top.....	1.60
1265 Ophir.....	42c	50 Union Con.....	1.10
320 Savage.....	21c	500 Ward.....	60c
315 Succor.....	31c	1850 Wells-Fargo.....	20c
3300 Silver Hill.....	3.15	100 Woodville.....	1.30
415 Union Con.....	70c	930 Yellow Jacket.....	12c
SALES OF LAST WEEK AND THIS COMPARED.			
Friday A. M. Nov. 22.			
135 Alpha.....	12c	175 Alpha.....	13c
1385 Alta.....	15c	1180 Alta.....	15c
725 Bullion.....	64c	315 Best & Belcher.....	2.10
315 Best & Belcher.....	2.10	505 Belcher.....	64c
75 Baltimore Con.....	1	50 Bullion.....	64c
2140 Con Imperial.....	85c	100 Baltimore Con.....	1
625 Crown Point.....	64c	1250 Boyle.....	50c
110 Chollar.....	34c	690 Caledonia.....	4.15
695 Crown Point.....	64c	265 California.....	2.00
110 Chollar.....	34c	480 Con Virginia.....	2.50
3170 Con Virginia.....	2.40	320 Chollar.....	34c
355 California.....	40c	945 Crown Point.....	66c
200 Dana.....	40c	15 Confidence.....	55c
1700 Dana.....	45c	1355 Con Imperial.....	1.05
875 Exchequer.....	4.50	100 Dana.....	40c
145 Gould & Curry.....	3	1045 Exchequer.....	4.40
585 Hale & Nor.....	9c	575 Gould & Curry.....	3.00
805 Justice.....	10c	2790 Hale & Nor.....	9c
345 Julia.....	2.35	1610 Justice.....	12c
220 Kentucky.....	5	575 Julia.....	2.00
220 Kentucky.....	5	40 Kentucky.....	5c
5705 New York.....	1.40	400 Leviathan.....	60c
100 Overman.....	20c	50 Lady Wash.....	10c
2550 Ophir.....	36c	475 Mexican.....	2.10
30 Occidental.....	1.20	100 North Carson.....	20c
605 Sierra Nevada.....	35c	50 North Con Vir.....	1.10
10 Seg Belcher.....	37c	745 Ophir.....	42c
460 Savage.....	2.65	200 Overman.....	23c
1090 Silver Hill.....	2.65	150 Rock Island.....	24c
550 Senator.....	31c	3790 Savage.....	10c
50 Succor.....	31c	54 Sierra Nevada.....	5c
40 Utah.....	12c	20 Seg Belcher.....	40c
670 Union Con.....	70c	120 Sierra Nevada.....	5c
1300 Woodville.....	1.30	100 Solid Silver.....	1.70
330 Yellow Jacket.....	11c	4230 St Louis.....	40c
AFTERNOON SESSION.			
450 Alps.....	1.10	575 Alps.....	1.10
400 Argentina.....	1.40	575 Alps.....	1.10
575 Alps.....	1.10	160 Boyle.....	50c
210 Alta.....	16c	325 Boyle.....	50c
300 Boyle.....	50c	325 Boyle.....	50c
50 Belmont.....	55c	325 Boyle.....	50c
50 Belcher.....	55c	325 Boyle.....	50c
50 Benton.....	2.35	325 Boyle.....	50c
150 Boyle.....	50c	325 Boyle.....	50c
200 Best & Belcher.....	1.10	325 Boyle.....	50c
700 Comanche.....	1.10	325 Boyle.....	50c
465 Con Virginia.....	2.40	325 Boyle.....	50c
1035 California.....	2.75	325 Boyle.....	50c
500 DeFrees.....	60c	325 Boyle.....	50c
620 Day.....	42c	325 Boyle.....	50c
51 Eureka Con.....	37c	325 Boyle.....	50c
100 El Dorado South.....	1.10	325 Boyle.....	50c
1055 Grand Prize.....	1.10	325 Boyle.....	50c
400 Gila.....	1.30	325 Boyle.....	5



# MINING SUMMARY.

The following is mostly condensed from journals published at the interior, in proximity to the mines mentioned.

## California.

### AMADOR.

**DAYTON IRON.**—*Cor. Amador Dispatch*, Nov. 24: The Loyal Lead & Co. are now engaged in moving 10 of the stamps belonging to the old Loyal mill on to the Pennsylvania mine (adjoining the Governor) and when they get to running, we expect to see a lively stream of the precious metal flowing through our town, as that company have undoubtedly a large body of very fine rock, easily got, and which according to the last lot milled, will pay at least \$12 per ton. It is useless to say anything about the Governor, as every one knows it is one of the paying institutions of California. I understand that the new drill, worked by compressed air, now running in this company's new shaft, works to perfection; and consequently sinking is progressing satisfactorily, although the rock is very hard. This shaft, when completed, will be, perhaps, the finest in the county. The Crown Point mine, here in town, is also a valuable piece of property. All it requires is the expenditure of a moderate amount of capital to develop the mine to a greater depth. This company have just started up their mill, it having been for some time on account of scarcity of water. The Bonanza mine, also in town, has lately been put in active operation by J. H. Davis, of Plymouth, who is understood to represent a large amount of mining capital, and who intends, if developments look favorably, to bond and purchase the mine. This mine, under the former management, turned out some splendid rock, but owing to lack of capital and other causes, it was not thoroughly prospected. The vein of quartz looks well, and shows a width of from 31 to 6 or 8 feet.

**SPRING HILL.**—*Amador Ledger*, Nov. 24: This mine is located between the Keystone and Talisman properties, both paying claims. It is as likely a site for the development of a first-class mine as can be found in the county. The ripe judgment of John Trelogan perceived this, and that expert miner set to work to organize a company to purchase and develop it. He was followed in the same last week on this mission, meeting with encouraging success. The Spring Hill company is incorporated with 120,000 shares. The property embraces 15,000 feet in length, by 600 feet in width. A shaft exists 12 feet deep, showing a ledge two feet thick at the bottom, the ore prospecting fairly for surface rock.

**FORST.**—The mill of 10 stamps is half built, and all the lumber and tools for its completion is on the ground. The work is to be carried out in such a manner that little difficulty will be experienced in increasing the number of stamps, when it becomes necessary to do so. The concentrators and 10 tons of iron pipe large enough to run a 30-stamp mill are lying at the railroad depot at lone awaiting shipment. The mill is designed for water power, with one of Knight's improved wheels. First-class holding works are in operation over the shaft. The shaft is 8x4 in the clear, 150 feet deep, with a vein at the bottom from 25 to 30 feet wide, 8 feet of which is considered good milling rock, estimated to yield from \$5 to \$12 per ton. There is also a body of ore near the surface which will average in the neighborhood of from \$6 to \$8 per ton. It is expected that the mill will be in running order before January.

**NEWTON COPPER MIN.**—Extensive improvements are being made at the famous copper mine on the road to lone. An engine of 125-horse power has been erected, with a number of large tanks for the precipitation of copper. Things are hustling around the works, giving the idea that the mine is to be worked energetically in the future.

### CALAVERAS.

**MINE SOLD.**—*Calaveras Citizen*, Nov. 24: Two weeks ago we made mention of the sale of the Ferguson and Walling mine to parties below. We have since learned that the purchaser was J. B. Haggin. During the past summer the mill on this mine has been lying idle for want of water, consequently a large amount of ore has accumulated on the dump. We are informed that the number of tons is nearly 1,200. It is valued—judging from the past average—at \$1,000. This mine has been one of the best paying mines in this State over \$300,000 having been crushed out with a five-stamp mill. The only change made was in the Superintendent. Mr. Wm. Clary is now acting in that capacity.

**MILL STARTED.**—*Calaveras Chronicle*, Nov. 24: Garland's new cement mill in Chili gulch was started up Wednesday. The machinery works first-rate and the battery—five stamps—is in the best of order and ready for the future. Quite a force of hands is engaged getting out gravel, and Mr. Garland is pushing things with his usual vim and energy. There is every prospect that the enterprise will prove a paying one, and its success will probably lead to the re-location and working of other claims on the ridge.

**MOUNT TIBOLUS.**—Work is progressing steadily at the Mount Tibolus mine, Mono district. Barton D'Arpling is general superintendent; John Champion, underground foreman. Operations are at present confined to sinking the main shaft which has reached a depth of about 200 feet. No more levels will be run until the shaft reaches a depth sufficient to thoroughly prospect the vein, when a new and larger mill than the one now on the mine will be erected and developments will warrant it. At present everything is showing well at the Mount Tibolus.

**WEST POINT JOBS.**—The water is out of the Champion. Sinking will be commenced next Monday. Porteus & Arthur have recently crushed 17 tons of rock that paid an average of \$105 per ton. West Point is still ahead in the matter of rich and productive quartz mines. A new mill is being erected on the Granite mine. It will be ready for work in a few days. Porteus & Arthur have lately made some very favorable developments in the old John Henry tunnel. They have a rich vein of quartz over three feet thick.

**MOSQUITO CULCH IRONS.**—San Bruno still sinking. Banner rashing things. Have recently struck a three foot vein in south level. Blue Jay has a whim in active operation. Harryhausen is taking out "gray up" rock. His mine is known as the "Sitting Bull." Horseme mine is being energetically worked. Lewis & Fairchild have a veritable bonanza. Grand Central is down 100 feet. Hartwell & Co. are rushing things on their mill site.

### MONTREY.

**QUICKSILVER.**—*Salinas Index*, Nov. 17: A letter from George Shriver, Superintendent of the Salinas quicksilver mining company, to the Secretary of the company at this place, conveys the welcome intelligence that the shaft connecting the upper and the lower levels in the mine was finished last week and the mine is now opened. The work of taking out ore was commenced the first of the present week and will be kept up all winter. This puts the mine in good shape and makes it a valuable property. If the rains hold off a few weeks, so as not to spoil the mountain roads, the company will probably ship ore enough this fall to declare a dividend.

### CONTRA COSTA.

**EMPIRE COAL MIN.**—*Contra Costa Gazette*, Nov. 24: The work of developing the Empire coal mine, as we are informed by Mr. Alexander Riddick, is being prosecuted by the owners with unflagging energy and large outlay of capital for the advantageous cutting and raising of the coal. The slope is already down 900 feet, with a gangway turned in the vein on that level, where a water lodgment is to be sunk 40 feet and a pump set for raising the water, one being already at work in the 600-ft gangway. The slope is to be immediately extended down 300 feet farther on the vein, where another gangway will be run and an shaft driven from that depth, which will also be permanently used for raising the water and coal from the mine.

The hoisting drum of the engine is also about to be changed from one of seven to one of 12 feet in diameter, with a 40-inch face, capable of carrying rope enough for hoisting from a depth of 2,200 feet. The railroad of three feet gauge, for delivering the coal into barges at Antioch, is completed and equipped with cars and a Baldwin locomotive of the most approved construction for a heavy grade road. Messrs. Judson & Belshaw, the principal owners of the mine, are large consumers of coal in their powder, candle, chemical and other manufacturing works, and will soon be able to supply themselves with fuel from their own mine as well as to furnish other customers.

### INYO.

**SALE.**—*Inyo Independent*, Nov. 17: M. A. Wheeler, owner of the Swansea furnace property, has purchased the San Benito mine, Cerro Gordo, from L. Lasky, of Lone Pine. The San Benito is among the oldest locations as well as one of the richest galea mines on the hill, and the sum paid therefor, \$17,000 as reported, is but a small fraction of its true value.

### NEVADA.

**WATER.**—*Nevada Gazette*, Nov. 24: The miners have plenty of water now to commence working their placer mines. We have some of the best mines of that class in the United States in the United States, and when all the mines are working, there will be better times here, and people in this town, we mean business men, will not be crying about money being so scarce that they cannot get enough to keep up their business. The cry is not only in this town, but it has been the same cry all over this State, and also in the Eastern States. We will have to wait and pray for better times.

**GOLD.**—*Nevada Transcript*, Nov. 25: Philip Richards, the banker, showed us yesterday, at his banking house, 13 bars of beautiful gold which he had received in small lots, and which was assayed and run into bars by J. J. Ott, the assayer. The total value was about \$5,400. It was good for sore eyes, these hard times, to look at.

### PLACER.

**RATTLESNAKE BAR.**—*Cor. Placer Argus*, Nov. 24: Mining is not so important an industry here as it used to be, but there are some still engaged in it who are confident of success. Messrs. Boles & Avery are fitting up a large claim in Mormon ravine, at a cost of about \$1,500. They have about 100,000 feet of bedrock flume, and nearly 900 feet of flume sections of track, and have recently a branch of the Bear river for five years for \$1,250. They have also some 10-inch iron pipe and a Little Giant hydraulic contrivance, and all the work is done by white labor. Mr. Boles is confident of being well repaid for his trouble and outlay when he gets his claim well opened. The bedrock sluices are all inch and a half plank. The main flume is fitted up and changing their hydraulic pipe in anticipation of the rainy season and big pay. The next mining claim is J. H. Campbell's, below us. He mines summer and winter. Schofield & Co. have bought a large amount of mining ground on the opposite side of the river, and have leased the Georgetown ditch for the purpose of working this old and new mines on a large scale. Myers, Ormsby & Co. are going to work out the old Kentucky mine, where most of the rich tailings of Wild Goose were dumped. Then there are Kelly's, and Hutch & Hawkin's claim that pay very well, besides some other claims worked by Chinamen.

**YANKEE JIM'S IRONS.**—*Placer Herald*, Nov. 24: The Georgia Hill claim, one of the most extensive hydraulic mines in this district, is thoroughly fitted up for the washing season, but owing to litigation, which has allowed certain parties to enter the claim, and have recently supplied them with water, there is some doubt whether this coming winter the owners will be able to obtain a supply of this essential element. Trafton's claim, next to the Georgia on the west, and one of the largest on the hill, having a breast of 1,200 feet and extending back nearly a mile, is being thoroughly prospected by the running of a bedrock tunnel, calculated to tap the channel. In the morning, Mr. Trafton is getting his ditches ready, with the view of washing some this winter. The Gilbert boys have their claim on the old Yankee Jim's channel in fine order for washing whenever the water comes. Having a large amount of dirt loosened up and their pipe and other fixtures all in position, they will, with a favorable water season, make a big run. Hodges & Trafton, on the north rim of the Yankee Jim's channel, have their claim, the "Rolling Jockey," nearly cleared out and ready for working. This is a new placer claim, consisting of about 40 acres, which the parties have recently taken up, and though its richness has not been proven by actual operation, it nevertheless prospects well. This quartz discoveries made in this district last summer are being followed up by pretty thorough prospecting, which is attended with more than average encouragement. Within the last few weeks other quartz discoveries have been made by the Gilbert boys, above Yankee Jim's, in Devil's canyon, which seem to be creating even more attention than the first. On this new lead the Gilbert boys have located 1,500 feet and James Hodges 1,500 feet. Two quartz claims, the Coon Trail and Narrow Gauge, are being worked with fair prospects. In the Narrow Gauge they have a four-foot ledge of placers, which assays about 80%. The "No Yes Don't" mine, which has been made and will not be lacking in force fuel when work begins and the tools need sharpening. Altogether the prospect for a busy season at Yankee Jim's is good, but whether it will be realized or not depends on the character of the winter, whether it be wet or dry.

### SAN BENITO.

**MINING AT TEOPA.**—*Cor. Semi-Tropical*, Nov. 24: The reports from our northern mines are at this time most decidedly encouraging. We learn from parties just in from the Resting Springs country that Mr. Osborne has gone to San Francisco for the purpose of procuring a smelting furnace which will have a capacity of 40 tons per day. Their present quartz discoveries have proved to be inadequate to meet the demands that were being made upon it. The mine recently discovered by Mr. Leach in the neighborhood of Resting Springs is proving to be considerable of a bonanza. The owners have sunk less than 30 feet on it and have already taken out \$15,000 worth of ore and have a vein of four feet in width. The ore from this vein assays \$225 per ton, while at least 100 inches of it will work over 1,000 per ton. The owners have been offered \$30,000 for their mine in its present undeveloped condition, but they say they have more than that in sight and consider it worth \$100,000. On the success of these mines rests very much of the future prosperity of this valley, as they must draw largely on us for their supplies of hay, grain, vegetables and fruits.

### TUOLUMNE.

**MINING PREPARATIONS.**—*Tuolumne Independent*, Nov. 24: Messrs. Reimington & Co. have begun the survey for a mining ditch at Summit Pass, near Columbia, preparatory to commencing to work the ground they filed on some time since. Mr. John P. Dart ran a line for them day. Their present quartz discoveries have proved to be inadequate to meet the demands that were being made upon it. The mine recently discovered by Mr. Leach in the neighborhood of Resting Springs is proving to be considerable of a bonanza. The owners have sunk less than 30 feet on it and have already taken out \$15,000 worth of ore and have a vein of four feet in width. The ore from this vein assays \$225 per ton, while at least 100 inches of it will work over 1,000 per ton. The owners have been offered \$30,000 for their mine in its present undeveloped condition, but they say they have more than that in sight and consider it worth \$100,000. On the success of these mines rests very much of the future prosperity of this valley, as they must draw largely on us for their supplies of hay, grain, vegetables and fruits.

### NEVADA.

**THE ENGLISH COMMISSION.**—*Eureka Sentinel*, Nov. 23: The English gentlemen composing the Richmond commission were to have taken their departure this morning. Concerning the Richmond property, we are creditably informed they were entirely satisfied. The mine is even more valuable than they had been led to believe before leaving London, and regarding its permanency and marvellous richness they have not a particle of doubt. Their report to the English shareholders will be, as a matter of course, highly satisfactory, thus enhancing the value of Richmond shares, and also indirectly benefiting our district. We are glad that these gentlemen go away so favorably impressed; but it is nothing more than those of

us familiar with the great resources of Eureka district and the Richmond mine in particular had a right to expect. The good words that the members of the Richmond commission are sure to speak for us beyond the Atlantic may possibly induce other foreign capitalists to seek investment in the district.

**METAMORAS FURNACE.**—*Eureka Republican*, Nov. 24: These works are now completed and are a credit to the district. The building is a very substantial structure, and is of sufficient dimensions to admit of another furnace, which the company have in view of the coming spring. The furnace will be started up on Monday morning, and the most successful run will be the result. The coal bin is full to overflowing, and the dump has hundreds of tons of rich ore in store, sufficient to keep the furnace in full blast for a couple of months. Most of this is custom ore. The mine is being energetically worked, and every stroke of the pick demonstrates a growing richness of the property, surpassing the most sanguine expectations of the managers. The new hoisting works will be completed in a few days, when the extraction of ore will be resumed. The dumps have a good supply awaiting shipment to the furnace. Messrs. Steele & Sturges, the managers of the Metamoras, have been indefatigable in their labors, and have placed the property on a most prosperous basis.

### LEWIS DISTRICT.

**PROSPECTS.**—*Eureka Sentinel*, Nov. 20: The papers to the northward speak flatteringly of the prospects of the above district. Two or three mines are yielding well and a mill and furnace are soon to be set in motion.

### MIAMI DISTRICT.

**SAMPLES.**—*Pioche Record*, Nov. 20: Mr. S. R. Nichols, Mining Recorder of Miami district, and who was also Recorder of Ely district in its palmy days and the discoverer of the Pioche and several other mines in this district, brought several samples of ore from there, the other day, to claims in which he is interested, to have assayed, which yielded as follows: Lily May, \$255; Illinois, \$157; Black Bess, \$263.

### NEWARK DISTRICT.

**ORE.**—*Eureka Sentinel*, Nov. 23: Ten tons of ore, from the Battery mine in Newark district, owned by T. Saffar & Co., has been sampled at the Metamoras works, and yielded as follows: First-class, \$303.30 in silver and 40% lead; second class, \$294 in silver and 28% lead. We are pleased to hear such good results from old Newark, and think she will yet come to the front as an extensive producer.

### OSCEOLA DISTRICT.

**YIELD.**—*Ward Reflex*, Nov. 20: It is estimated by competent judges that over \$30,000 have been taken from one gulch within the past six months, working an average of not over 20 men, and some of the nuggets found, if exhibited in San Francisco, would create a great furor of excitement and cause a rush to the gold fields. The nugget picked up by the man Darling, while working for Vizan & Co., and run into bars by an assayer of this place, yielded \$3,500, and a few days since there was found on the same gulch by Chinamen a nugget weighing \$300. A dozen or more other nuggets, weighing all the way from \$12 to \$150 have been taken out by different parties within the past 10 days.

### RAILROAD DISTRICT.

**LOOKING UP.**—*Elko Independent*, Nov. 20: The new water jacket smelter for Railroad district arrived here today from San Francisco, consigned to M. P. Freeman. The iron portion of the furnace is complete, and is now paying it are the iron slag-pots, mounted on wheels, and the paraphernalia necessary to a complete smelting outfit. We learn that considerable ore is already upon the dumps and more is being constantly extracted, so that by the time the new furnace is ready for business, sufficient for a good run will be at hand.

### WHITE PINE DISTRICT.

**THE HEXAY TUNNEL.**—*White Pine News*, Nov. 24: Most people in this vicinity are under the impression that this enterprise is lying idle. This is a mistake. Work has been going on there nearly all summer, though no great blow was made about it, and now we learn that the tunnel has penetrated a quartz formation, carrying streaks of ore which assays \$10 to the ton and gives encouraging hopes of near approach to an ore body. If this company had during last season expended a reasonable amount in the development of their property, there is every reason to believe they would now be in possession of a valuable mining property. We hope the late favorable indication will stimulate them to prosecute more active operations than they have heretofore done. A gentleman, whose name we did not learn, arrived here from New York a few days ago, who takes charge of the mechanical department of the mine.

**THE FAY MINE.**—Superintendent Fulton arrived here from San Francisco the latter part of last week, commissioned to resume work on the Fay mine. A force of men were engaged this week and work commenced. The Fay ore will be reduced at the King company's furnace. This mine has, in years past, produced some very rich ore, and we learn that in lots many of the same kind left in the mine. The machinery for the King furnace arrived from Eureka last evening. As everything else is already fitted up, it will require but a very little time to put this machinery in place. Ten days more will see the furnace puffing away.

### Arizona.

**PECK DISTRICT.**—*Arizona Enterprise*, Nov. 14: Henry Court, a good, practical quartz miner, recently engaged on the Peck lode, arrived in Prescott, Sunday last, and informs us that the mine is looking better and is turning out a greater abundance of rich ore than ever before. While at work in it, he says he often mined out more than \$2,000 worth of ore in lots many of the same kind left in the mine. The machinery for the King furnace arrived from Eureka last evening. As everything else is already fitted up, it will require but a very little time to put this machinery in place. Ten days more will see the furnace puffing away.

**HUMBOLDT DISTRICT.**—Mr. Rowe came in from the Tip-top a day or two ago, and gives good reports concerning it and other mines in the misnamed district. The Tip-top company's mill will soon be running.

**BRADSHAW DISTRICT.**—Work on the Tiger and other lodes in this district is progressing favorably.

**CRICKET CREEK.**—Murt Meselson's mill will soon be running on rich silver ore. The prospects of this old district grow brighter and brighter.

**BLACK HILLS.**—Considerable arastrating and prospecting is being done in the hills to the northeast of Prescott, and it is now firmly believed that the old hills contain almost if not quite as good lodes as those of the Sierra Prieta.

**LYNK CREEK DISTRICT.**—Continues to send to Prescott her quartz ore from quartz and placer mines.

**BIG BUD DISTRICT.**—Although not making much fuss, has lots of the stuff to do it with, and will yet give a good account of herself.

Messrs. Roberts & Poland may soon suspend arastrating for the winter.

The Kit Carson company are quietly developing their property, and have some ore here ready for shipping to San Francisco.

New and rich silver mines have recently been discovered in the Tonto Basin region of this territory by Messrs. Boyd, O'Dougherty and other prospectors, who are now at work developing the same. The surface ore assays all the way from \$250 to \$800 to the ton. These mines are situated in a well timbered and fairly timbered region, about 60 miles to the southeast of Camp Verde and within a short distance of Green Valley.

B. H. WEAVER has acquired an interest in the Silver Bell lode, in Humburg district, out of which he expects to grow rich.

GEORGE CLARK, a California mining expert, is looking at mines belonging to George Monroe and others, in the Bradshaw mountain country, with the view of purchasing them.

**THE SENATOR.**—We sincerely hope that this fine mine will not long be permitted to stand unproductive. With good business management it can be made to pay, and there is a mill on the ground, we hope local capitalists, to whom its late manager, Mr. Fredericks, is indebted, will form a company and work it.

**YUMA MINE.**—*Arizona Sentinel*, Nov. 24: The Yuma mine, near Tucson, in which Judge Porter has an interest, is about to be one of the largest mines in the Territory. The claim takes 3,000 feet of the best part of the ledge. On this they have sunk a shaft 35 feet. From the bottom of the shaft has been run a cut across the ledge 20 feet, all in metal. Another shaft is down 15 feet and a tunnel has been run in 30 feet on ore creppings. From these openings have been taken some 200 tons of ore, now lying on the dumps. The ores are chiefly galena, rich in silver. The Virginia mine, a late discovery in the same vicinity, is being vigorously prospected by Dr. Goodwin for himself and Judge Porter. A working test will soon be made by both furnace and arastra process. The lowest assay yet made gives over \$400 per ton. The vein is wide and of great extent.

**CATTLE DOME** appears to be getting ready for another season. The Bonchontos is down 150 feet on five-foot metal, from which comes 12 tons of ore. The lead is getting one ton a day from the old Arkansas. The Old Nagle miners are still turning out two tons of lead daily, and have 40 tons ahead of the team. Bonard & Johnson's works are stopped on account of a row between them.

## Colorado.

**CAMP TELURIDE.**—*Boulder News*, Nov. 17: It may be owing partly to the late inclement weather, and partly to other causes, but the fact is that mining in this vicinity has been at a standstill, and the outlook is less encouraging to the majority of our residents than at any time within the past year. But still there is something doing. Work on the Eclipse in driving a westerly drift is still going on, and probably will go on while the vein continues its present value. F. Transue is also at work in the gulch, and is taking out this yellow stuff. John Dupuy is also at work on his gulch claim, and admits he is having some success. Wurtz & Co. are at work on the Dime lode, and one or two other claims in the same vicinity are being worked by other parties. The concentration mill of Mr. Crisman is shut down at present writing, but will undoubtedly be going again as soon as a supply of the proper kind of ore can be obtained. Being at Salina a few days ago I tramped up the hill made famous by this mining lode, and found several men at work sinking up a shaft-house on the Cincinnati lode. This lode has a pay vein of about 14 inches, and though its depth is a mere prospect hole, the ore it furnishes is a compact mass of good-looking stuff showing gray copper and sylvanite thickly spread through it. This lode, as also the Omar Pasha, is located near the Beezie Tunnel. The Omar Pasha is now being worked by A. N. Burchill & Co., and is, like the Cincinnati, a most promising lode. I hear that work is soon to be resumed on the Telluride tunnel, near the mouth of Gold run, and hope it is true.

## Dakota.

**MILLS.**—*Black Hills Miner*, Nov. 16: There are now 50 stamps employed in reducing the ore of the Blacktail lode. The 20-stamp mill of the Blacktail, the 20-stamp mill of Foot & Hildebrand and the 10-stamp mill of Whitney & Co. The mine is the property of Major Welch, of the Welch house, and J. B. Pearson, Esq., Superintendent of both the mine and the mills being under the control of the latter gentleman. We understand that the ore body is almost practically inexhaustible, and carries out of over average grade. Good results are very confidently expected.

## Idaho.

**LAST RECEIVED.**—*Idaho World*, Nov. 20: From a letter received by Ralph Goodfellow, from Atlanta, a few days ago, we learn that splendid rock is being taken out of the Last Chance mine. Baxter's mill will run this winter on rock from the Leonora mine, which is looking well at present. Several of the boys in that burg, among whom are R. Turner, Wm. Butler and Wm. Groves, will spend the winter in the East.

**CHUCKLE CANYON CREEK.**—Hon. J. H. Hawley informs us that a big strike has been made in the Ebenezer mine on Canyon Creek. The first rock milled from this ledge was from the surface and yielded \$125 per ton. With this encouragement the company ran a tunnel to tap the ledge and open up the mine for stoping. A vein of from six inches to three feet in width was reached, and supposing this to be the same that had been discovered on the surface, the work done this season was completed at this point, where the rock on which the last run made was obtained. In extending the tunnel on the vein to tap the shaft, it was found that, although in the same ledge, which is 30 feet in width from wall to wall, they were on separate pay veins. A crosscut being run, the vein on which the shaft is sunk was found, running parallel with the other. Being tapped in several places, the average thickness was found to be from four to six feet, as rich if not richer than heretofore extracted from that mine. This strike, which is considered enormous by all who have seen it, is very encouraging to other mine owners in that section. Work will now be done on a larger scale and Canyon and Fall creeks will yet be numbered among the leading mining districts of the coast.

## Utah.

**BEAVER CREEK.**—*Shanties Cor. Salt Lake Tribune*, Nov. 18: I have just returned from a visit to Frisco, the coming burg of this county, and I found things there decidedly lively. The Frisco smelting company is now receiving large quantities of ore from Star and the surrounding districts, and is making lots of high-grade bullion. The large building now being erected by the miners of the great Horn Silver mine to enclose three new stacks is fast approaching completion. Water is found in abundance. The leaching process has a fair trial, proved a success on some classes of Horn Silver ore. Harris & Thackeray made the trial at Frisco yesterday, before the owners of the mines, and worked the ores up to 80% of the assay. Arrangements having been entered into satisfactory to both parties, Messrs. Harris & Thackeray will immediately begin to erect the works on a large and extensive scale. This will be the beginning of a new era in the working of silver ores on a reliable and economical scale.

**COPPER MINES.**—Not only do silver and lead abound in these parts, but deposits of copper also, and efforts are being put forth to induce copper sharps to try their hands at making copper ingots.

Some rich discoveries in the way of high-grade silver ores have been lately made.

**MINING PROPERTY IN PICTAL CANYON** has advanced 50%. The Commercial mine, in this canyon, owned by James Laselle and D. McNamara, has, by late developments, exposed a five-foot vein of high-grade ore.

**SAXBY.**—In my last I mentioned the fact of the Flagstaff mine being shut down and the machinery moved out by Mather, Geist & Ruston to the mill purchased by them some time ago. Many persons here labored under the idea that it was only temporary, on the ground that lead would soon come up, and the legal owners of the furnace would come to the surface and make Sandy sink. But lead has not advanced much, neither can any new find the furnace, and the consequence is the machinery that many expected would be soon put back from whence it came, has been sold to different parties in Parley's Park and Leeds, and the remainder is offered to the highest bidder for cash. This fact has caused many enterprising citizens of this place to look on Sandy the coming winter as likely to be dull, which from an appearance your correspondent can't help thinking is correct.



## Trees and Rainfall.

No. 2.

[Written for the Press by SAMUEL PURNELL.]

## Nature's Revenge.

The superficialist, when viewing the desert and its ruined memorials of the former grandeur of its people, is apt to feel sorrow and pity for the wasted land and the misery of its inhabitants; but this should not be so, for it is, in fact, but the working of nature's revenges against her despoilers and is a fitting and just punishment for destroying the rain-producing forests. When a people, in their ignorance and selfishness, destroy their forests, they are uniformly and deservedly punished by extermination, inasmuch as their home is made a desert. All countries that are heavily wooded are favored with copious rains because they are wooded, and are wooded because of the rains. Grass and shrubbery cannot long grow or flourish far away from the influence of forests, as grass cannot by its own rain-producing power sustain itself. To increase the means of physical and mental pleasure and to furnish subsistence for larger numbers, the soil should be stimulated to its highest productivity. This productivity cannot, however, be obtained by clearing away the forests and thereby increasing their area of plow-land, but rather by retaining a due proportion of forest and bestowing additional labor upon the remaining land. The desert is even now approaching many a fair valley and the sand is destined to cover many portions of the earth now occupied by powerful nations, because they are destroying their forests and are inviting and will receive the desert. The same causes will produce the same results as of old.

## The Effect in Our Own Country.

Turning our attention now to the influence of trees upon rainfall in our own country, we are met upon the threshold with the fact that throughout the entire country east of the Alleghany mountains more than half of the primeval forests have been destroyed, and the rainfall is much less than it was a century and less ago. The summer rains, upon which the fertility and inhabitability of a country must chiefly depend, are greatly lessened, and scarcely serve once in five years to produce fair crops. Long continued drouths during the summer season occur with alarming frequency in districts where 50 years ago a scarcity of rain was unknown. Creeks that within this century flowed past sylvan banks and grassy meadows, hearing to the sea the water of a thousand springs, now flow by bare hills seamed with gullies, and by hazy and sedgy fields, carrying so little water as to be often dry during the summer. The memories of the old men are burdened with such narratives. The mountains of central and southern Pennsylvania have been denuded of their forests, and no longer does the Susquehanna send its wonted volume of water to the sea. The great rivers of western Pennsylvania are considerably diminished in flow, but not materially, as the forests around their sources, being in rugged and distant mountains, remain for the most part undisturbed. Throughout the entire New England States the small streams are gone, and they can no longer suffice to turn the wheels of the mills. The Connecticut river no longer carries a large and constant stream, but by the clearing of the forests around its sources, has been converted into an ordinarily insignificant stream, and during periods of rainfall into a raging torrent.

While the mountain streams of the Atlantic coast are diminishing, and threaten to become extinct, except during the time of rainfall, still more calamitous has been the effect of tree destruction upon the climate. In some districts the mean annual rainfall is not materially reduced, but its usual and necessary form of distribution is altered. Where once rainy summers were known, they are now unknown, and the rain falls mostly in winter. In many districts farming can no longer be made profitable, as the summer rains often fail, and drouth destroys the growing crops.

If we ask for the

## Reason of this Failure of Rainfall

We are able in reply to assert that it is not due to any cosmical causes, but that it is wholly owing to the ravages of man in his endeavors to rob nature of her leafy covering and transpiring forms in order to minister to his selfishness and greed. A century ago the Atlantic coast was densely wooded; both summer rains and winter snows were abundant and in season; the climate was temperate and even, and the earth smiled with the harvest. At present these conditions are materially changed. With a strange ignorance of forestry, and a curious disregard of all the instincts of natural self-defence, the people have allowed those called "owners" to fell the forest that all have so great an interest in preserving, and to bring approaching desolation upon an entire territory. While ignorant of the causes and the remedy, they notice the unfavorable change of climate; that the summer rains are failing; that great storms with deluges of rain are more frequent and more destructive; that the streams are drying up; that the summers are becoming dryer and hotter, and the winters more stormy and cold. These results may be justly charged upon the unrestrained

and indiscriminate destruction of the forests; and that it is no worse is in consequence of the custom of Eastern farmers of preserving some woodland for domestic fuel, to the immense consumption of coal, and to the fact of a few primitive forests still remaining upon lofty and remote mountains, where it would not "pay" the despoilers to venture.

## The Prairies

Of the Valley of the Mississippi river, and its tributaries, possess few forests; yet summer rains usually fall in ample volume to mature crops. These prairies would long ago have been converted into deserts, except for local meteorological conditions. The prairies, as well as the country east of the Alleghany mountains, receive their summer rains by the condensation of moisture from the great equatorial monsoon, blowing from the south Atlantic, following the Gulf stream to the shores of Louisiana and entering the low lands of the Valley of the Mississippi. The monsoon being a hot wind, and saturated with moisture at a high temperature, as it blows over the cooler land is itself cooled below its dew-point and precipitates most of its moisture in copious rains. This moisture is quite rapidly precipitated, the rainfall being 50 inches or more in Louisiana and only half as much in Illinois. Were the prairies well-wooded far more rain would fall upon them in summer. Although the Valley of the Mississippi now receives its summer rains from the tropical monsoon over the low lands of Louisiana, even without the aid of forests, the case would be far different if the northern shores of the Gulf of Mexico were lined by high and snowy mountain. Then the monsoon moisture would nearly all be caught upon the mountains and very little would cross them to fall as rain upon the prairies. The latter would become as dry during the summer as the interior of California, and without irrigation be as sterile and uninhabitable. There could be no recourse against their inhabitability except to artificially cover them with forests.

The hypothetical case of the Mississippi valley is in fact that of Peru; the same wind that blows the moisture from the south Atlantic toward the Gulf of Mexico, blows also across Brazil toward Peru, but its moisture is nearly all extracted by the snowy summits of the Andes mountains, forming the sources of the mighty Amazon, while Peru upon the west slope receives scarcely any rain at all. The same substantially may be said of the entire western coast of equatorial America; and the western coast of Mexico. As to the California coast it will be shown hereafter that the Atlantic monsoon never reaches it.

## Eucalyptus Wood and Growth.

At the meeting of the California Academy of Sciences on Monday of last week, there was a discussion with regard to the fire-resisting qualities of the eucalypti, in the course of which some facts were brought out which will be of interest to our readers. At a previous meeting Dr. Behr had referred to a eucalyptus, standing in the grounds of the old German hospital, on Braman street. "The tree had passed through the fire of August, 1876, and exhibited the peculiarity of resisting the action of the flames, a property well understood in Australia."

Mr. F. T. Newberry, at the last meeting, referred to this assertion of Dr. Behr's and also to the following paragraph, clipped from the papers, and purporting to be the remark of Dr. Kellogg in connection with that of Dr. Behr: "Dr. Kellogg stated that eucalyptus shingles were in common use in Australia on account of their being fire-proof. It was impossible to fire a roof made of this material. There were some 132 species of eucalypti, but all seemed to possess this non-perishable quality to some extent."

Mr. Newberry stated that he was a native of Australia and brought up in the country, and was familiar with the genus eucalypti, from the tropics to the snowy mountains, having resided in Queensland, New South Wales, Victoria and South Australia. Mr. Newberry said:

"What I know of eucalypti, gentlemen, is diametrically opposed to these statements of Drs. Behr and Kellogg at the last meeting. I have to say that I am familiar with the terrible brush fires which ravage the country nearly every summer, having had to fight them more than once; nothing can exceed the fierceness with which the fire seizes on these living trees, running from the butt up to the topmost branches, enveloping the whole tree in a mass of flame in an instant. A great number of these trees being hollow, they offer a good hold to the fire and are speedily burned to the ground. The settlers would be amazed to learn that one should use these trees as a defense against fire. The fact is that they clear a wide space between the forest and their line of fencing; their chief dependence there when the brush fires threaten their improvements is to run a plow around their farms outside of their lines of fencing. Of course the exuberance of their foliage would shelter a building from the scorching heat of proximate conflagration, but that they will resist the action of flames is altogether wrong. It is a very common opinion amongst country people that the leaves of these trees take fire spontaneously when rubbed together by the wind during the extremely hot summer days. The origin of three-fourths of these fires cannot be accounted

for; they generally run in comparatively still weather, and consist of isolated bodies like camp fires on a large scale. The fires seldom proceed in one general direction, but spread all around where there is anything inflammable to be met with.

"But the inherent vitality of these trees is something astonishing. I have seen the blackened charred stump the next season put forth clusters of leaves, and aspire again to the dignity of trees of the forest. The eucalyptus is used as firewood for the simple reason that there is not two per cent. in general of any other kind of timber; it is used as much in the green state as in the dry. Shingles and the bark of the stringy bark (*Eucalyptus obliqua*), are the only roofing materials used, excepting a few slates. The best shingles are made of the iron bark (*E. leucocorylon*); the bark is very rough and tenacious, the grain of the wood close, and it splits evenly; but these shingles will burn just as easily as redwood shingles. I have made them, and know that they make very good kindling wood. They often get burned up at the stump by the brush fires while in a green state. I have no hesitation in saying that they offer no more protection to a building than redwood shingles.

"It has occurred to me that, perhaps, the knowledge which I have of this species of timber might be of more useful account to the members of this academy and the public, and I therefore offer the following remarks:

"The species of gum trees cultivated here are not the most ornamental or useful. In this respect there is none surpasses the Black Butt (*E. pilularis*). It is very symmetrical, has a bold, straight barrel covered with bright bark, but the lower limbs and branches contrast beautifully with their clean, silvery bark. The timber is more free from gum shakes, splits easily, and works more economically than any other kind; for timber purposes it furnishes logs generally from three to four and a half feet in diameter, and from 40 to 60 feet in length. The grain is close and hard to cut. It is considered good work for two men to cut on the average 150 superficial feet per diem. I never saw any one who would attempt to cut up a log in the dry state. It then becomes very hard, and almost impossible to utilize except as firewood.

"The forests in general are open and the trees lit for lumber thinly sprinkled among a large number of gum trees properly so-called, the principal of which are spotted gum (*E. maculata*), the white gum (*E. viminalis*), blue gum (*E. globulus*), red gum (*E. rostrata*); also the iron bark (*E. leucocorylon*), and stringy bark (*E. obliqua*). The spotted gum runs up to a good height with a stout, straight barrel, but the quantity of gum in small pockets which is distributed through it make it very difficult to cut, and the timber is worthless wherever these pockets (or shakes as they are called) occur. The trees are split up, however, with mauls and wedges and furnish very good posts. The red and blue gums are very seldom sawed up, the barrels being generally crooked. The timber is close-grained and inlaid; selected portions free from streaks are used by wheelwrights and ship builders. The iron bark is a very fine tree, generally very straight and often 80 and 100 feet clear in the barrels, with a fine and well formed top. It is but seldom used on account of its hardness and of the great difficulty of removing the bark which is hard, thick and very tenacious; it is used for shingles, long girders and piles, but the teredo is found to attack it as readily as pine. The aborigines of the country generally make their spears, boomerangs and waddies of this wood. The stringy bark is anything but a beautiful tree, but it may be considered as the poor man's friend. It is often of large size. The wood is the easiest to cut of any of the eucalypti, being generally open and straight grained and free from gum shakes. It is not so durable as many of the sound wood of the other varieties above mentioned. It is generally hollow and is worked up into shingles, rails and pickets for fences. The bark is very useful for roofing, from two up to five lengths of eight feet each being taken from a single tree. The bark is about one inch thick and very tenacious. It is stripped from the trees either when standing or fallen, and is then laid flat upon the ground for a week or so, weighted down with logs, and is then ready for use. Most of the small huts throughout the country are roofed with this material. If these finer sorts of eucalypti before mentioned were planted here instead of the most worthless, blue and red gums, we could have not only more beautiful trees possessing all the well known anti-fibrile qualities of those trees and equally rapid growth with the common varieties, but useful also as a good sound, hard species of timber."

Dr. Kellogg said that the remarks attributed to him in the papers were incorrect. The statement he made was that some forms of the eucalyptus had the property of not blazing. That in the case of a shingle made of some varieties a hole would burn through in case of a coal falling upon it, but it would not blaze up. That was the only statement he made. He never said the shingles were fire-proof, and the reporters had misrepresented him.

Dr. Behr said that the eucalypti had a certain immunity from fire. The leaves will burn very quickly, but the wood is difficult to set fire to, and is not apt to hold fire. He knew of only one instance of an extensive fire in a forest of eucalyptus trees. The trees are spread over the entire country, in the open or the scrub, in South Australia. There nearly every year large fires occur on the plains. The eucalyptus in these districts frequently showed traces of this

fire, but he never saw a tree destroyed by it. In the scrub, after the fires, the only remaining vegetation was the eucalyptus trees, and they sprouted again. In the one instance I refer to the eucalypti took fire and were burned long before I was there, but none of the settlers recollected the fire, although the traces of it were there.

Mr. Newberry thought Dr. Behr was mistaken altogether.

Dr. Behr said he had resided in Australia several years, and knew whereof he spoke. He had been there for the purpose of studying botany, and traveled in different parts of the country, not confining himself to the cities alone. He thought the eucalyptus wood would give considerable heat when once lighted. When other vegetable growth was destroyed by fire, however, it alone sprouted out again.

Mr. Newberry said that in the diggings he had lighted two green logs of eucalyptus wood two feet thick and they had held fire for two weeks, even in rainy weather. It was green wood also, the dry wood being too hard to chop. He said that in the great "Black Friday" fire in Victoria all the eucalypti were burnt—that is the branches—but the trees budded out again ultimately. He said also that the trees would stand any ordinary amount of cold.

Dr. Behr asserted that the most northern point at which the tree was cultivated in Europe was Geneva. They have been planted in Florence, Pisa, and some places in Southern Europe where they have frosts.

Mr. J. R. Scupham said the trees had been planted in Florida and Georgia, but they did not grow, the frosts destroying them all.

Dr. Kellogg said that Mr. Newberry's remarks were especially valuable, inasmuch as he had called attention to the fact that we are not cultivating the best varieties here, and this he had always thought to be the case. The black bark grows nicely in Oakland. People who plant the eucalyptus should be careful to make a good selection of species. He thought, however, that Mr. Newberry was mistaken with reference to his statement that the teredo attack this tree as readily as it does pine. We have in the academy a specimen which has been in the salt water as a pile, and no teredo had touched it. We had also another piece of common pile which had been alongside of it, which had been bored all through by the teredo. He thought the specimen was of the wood of *E. marginata*.

Mr. Scupham said that the wood of *E. marginata* does resist the ravages of the teredo, the same as the *E. rostrata* resists those of the white ant. Wood of the *E. rostrata* will last as a railroad tie from 9 to 14 years, and in some instances it had lasted 18 years. The reason why these varieties were not cultivated here extensively, was that all the varieties will not grow here. Some of the varieties flourish here as well as in Australia, and some even better, the *E. globulus*, for instance. The *E. cornuta*, *E. siealis* and *E. hemiflora*, grow fast and large, and the *E. gigantea* also. Aside from these, it is difficult even to sprout the seeds of *E. marginata* and *E. rostrata*. These will grow here perhaps six feet in as many years, while the *E. globulus* will in the same space of time reach a height of 60 feet in some places. The peculiar combination of moisture and heat is favorable for some varieties, but not for others. He tried some experiments last year for the Southern Pacific railroad company with these trees. The *E. globulus* and *E. cornuta* were planted in the Colorado desert. They grew all right during the summer, and were from three to six feet high, but the winter frosts of Southern California killed them all.

Dr. Behr thought the growth of some varieties depended greatly on the character of the soil. In some districts he had found the same variety on one side small and apparently stunted and on the other side large and flourishing.

Mr. Scupham stated that he had searched all over the State to find a large specimen of *E. marginata*, and although he had heard there were many, on investigation he had found none more than six feet high anywhere.

Mr. Newberry spoke with reference to Dr. Kellogg's statement about the "iron bark" and teredo. In New Zealand they suffer greatly from the teredo. There they tried every variety and found the iron bark was as worthless as any other kind for protection from the borers. With reference to Mr. Scupham's remarks about the loss of the trees in the Colorado desert by frost, he thought it was more probable that the winds had done the mischief.

Mr. Scupham said the wind belt on the Mohave was about six miles wide and the winds only prevailed in the summer. The trees were all right then. In the winter there was no wind but it was cold and frosty, and at that time the trees died.

Dr. Kellogg thought that Dr. Behr's remarks about the influence of the character of soil were correct. If you go to Mendocino county, you will find the native chestnut with a shaft from 75 to 175 feet in height and six feet through. On a ridge near by you will find the same tree simply a shrub three feet high and bearing fruit. Near here, on the other side of the bay, the chestnut grows up bushy in character and only six feet high. These facts certainly exist, and the climatic conditions alone could hardly amount for the very great difference.

THE dividends declared and paid to date by the bonanza companies amount to \$54,000,000. Of this amount the Consolidated Virginia company has paid \$34,560,000, and the California company \$19,440,000.



## Curiosities of Sleep.

"I wish I could write a chapter upon sleep," exclaims Sterne in "Tristram Shandy," and echoes Sancho Panza's soliloquy: "God's blessing be upon the man who first invented this self-same thing called sleep; it covers a man all over like a cloak." A little folding of the hands to sleep, against the abuse of which we are all specially warned, had a peculiar fascination for Don Quixote's fat squire; and how many of us can hear with complacency the warning knock that announces our shaving water and bids us arise to face the duties of the day? Although sleep is familiar to all of us, it continues to be almost as much of a mystery as ever it was. Physical peculiarities during this oblivion of the senses have been discovered and commented on, but those who have most studied the subject confess their inability to penetrate its inner mysteries. In the "horror of darkness" that fell on our first parent, in the visions of patriarch and prophet, and occasionally in the well-attested confirmation of prophetic dreams, we mortals have examples of sleep that may truly suggest "thoughts beyond the reaches of our souls." To dreaming, which presents such an odd phase of slumber, the attention of such men as Locke, Abercrombie and Watts has been given without any very satisfactory results; but it is rather to sleep and sleepers than to dreams of somnambulism, that we would here invite consideration. That there is something awe-inspiring in the contemplation of a sleeper in that trance, "like death without its terrors," has been finely expressed by poets, and is an undesirable emotion that many of our readers must have experienced.

Despite all our familiarity with this strange resemblance to death, it is as impossible to test the exact moment of our becoming unconscious as it is to account for the apparent duration of our visions during repose; and the vagaries of sleepers have proved an enigma to all the intellect that has been brought to bear on the subject. Like the somnolent Irishman, who, when asked by his employer how he could manage to sleep so much, replied: "Sir, I pay attention to it," people have been known to sleep comfortably for upwards of 24 hours at a stretch; like Quin the actor, and DeMoivre, the mathematician. Old Parr slept away most of his latter days; but among statesmen and generals we are furnished with examples of others who have managed with remarkably little sleep. Stow tells us in his "Chronicle" that "the 27th of April, 1546, being Tuesday in Easter week, W. Foxley, pot maker for the mint in the Tower of London, fell asleep, and so continued sleeping, and could not be waked with pricking, cramping, or otherwise, till the first day of the next term, which was full 14 days and 15 nights. The cause of his sleeping could not be known, though the same were diligently searched for by the King's physicians and other learned men; yea, the King himself examined said W. Foxley, who was in all points found at his waking to be as if he had slept but one night." There is an account of a French woman who for sometime suffered from sleep visitations, varying from three days to a fortnight in duration; and a girl at Newcastle-on-Tyne is said to have slept for three months without waking, which latter process took about three days to accomplish. An extraordinary case is on record of a lady who slept for 20 days when 18 years old, 50 when she was 20 and on one occasion from Easter Sunday, 1862, until March 1863—that is, almost a year—during which state of what physicians call hysteric coma, she was fed with milk and soup, one of her front teeth having been extracted for that purpose. Another emulater of the "Seven Sleepers" was Samuel Chilton, a farm laborer, who, in 1694, indulged in a nap that lasted four months, or from April 9th to August 7th. On awakening he dressed and went into the fields, to find his fellow workmen cutting the corn he had aided in sowing just previous to his long slumber. He had another long nap in the same month, and after the medical pharmacopoeia was almost exhausted in applications to arouse him, only rose up to ask for some bread and cheese, but fell asleep again ere it could be set before him. He came to himself some eight weeks later on, after which these unpleasant somniferous relapses are said to have left him.

They are having a mining war at Central City, Dakota. The miners who took possession of the Keets mine in lieu of arrears of pay still hold it. The latest news is that they have a communication with the Hidden Treasure mine, and contemplate retreat through the tunnel when the fight becomes too hot for them. All efforts at a compromise have failed, and unless the Sheriff burns the timbers of the shaft and attempts to starve them they have the best of the game.

The Southern Pacific railroad has made a reduction in its land rates, and announces that the charge on freight from the anchorage to Los Angeles will be \$2.50 per ton. The rate on corn in car-loads, from Los Angeles to San Francisco, has been reduced to \$5.50 per ton, and on broken lots to \$6.25. The aggregate reduction will amount to about 50% of the old schedule.

A FREE Labor Exchange has been opened at Nos. 33 and 35 O'Farrell street, in this city. No fee is taken from either employer or employed.

## USEFUL INFORMATION.

## Detecting Breaks in Bridges and Culverts.

Now that the season of heavy rains, and perhaps of floods, is upon us, it will be valuable to know how to watch their effects upon bridges and culverts and how to save them from harm. A writer in the *Railroad Gazette* takes up this subject, and we quote a few paragraphs:

It is not always possible to know whether a bridge or culvert has been damaged or not until the water subsides. All may appear safe above the surface of the water, while the work of destruction may be silently going on below. If soundings and probings fail to disclose mischief a close observation of the surface of the water may indicate what is going on below. A whirlpool near the face of a wall is evidence that water has effected an entrance through a crack or that a portion of the wall has been undermined, and water is running back of the wall. A speck of foam, a chip or some light floating substance floating in a circle, on the water, shows that a tiny stream is slowly but surely leading the waters to the work of destruction. If water has found a passage out of the proper channel the quantity and force of the fugitive element may be known by the size of the circle described by floating substances and the velocity of their movements. As soon as water has found a passage sufficiently large to allow of the discharge of a continuous stream, however small at first, it rapidly becomes larger. At first the surface of the water above the aperture will not be disturbed sufficiently to be discernable, except by the movements of floating substances, as above mentioned. These substances will at first move slowly in a continuous circle on the surface, but as the discharge of water through the break becomes greater, the chips, etc., are drawn under the surface and disappear.

If sticks, etc., of any considerable size, are drawn into the whirlpool and lodge in the passage, the lodgment may be known by its checking the flow or discharge of water, which will be evident by a reduction in the velocity and dimensions of the whirlpool. If articles drawn in do not cause any interruption of the discharge, it is evident that they have been discharged below and their appearance should be looked for, which will indicate the direction of the stream which is doing the damage. The "evil," if watched on the lower side of the embankment, may show the nature and extent of the wash. Rocks, trees, logs and driftwood will sometimes form an eddy or back current, which works away quietly below, giving no sign of what is going on, but the action and force as well as the direction of the currents can be ascertained by throwing in blocks of wood attached to lines. Fasten a piece of iron or a stone a few feet from the block of wood on the line, and this will serve to indicate more clearly the direction and force of the currents. If the currents are noticed to carry gravel, clay, particles of cement or any material of which the masonry or embankment is composed, it is certain that destruction has commenced. In this case, perhaps, the most that can be done will be to remove, if possible, the obstruction that causes the destructive currents and throw rubble and riprap where the wash is supposed to be going on. But, of course, action in such cases must be governed by the peculiar circumstances, no two cases admitting of similar treatment. But in case an embankment is being destroyed by the process first mentioned, the work of destruction may be readily stopped by the use of bundles of hay, straw or grass. Marsh hay is preferable for the purpose, but if that is not convenient, other hay, fine brush or straw or weeds, tied up in bundles and thrown into the whirlpool, will effectually stop the wash. When the aperture has been well stopped with hay, etc., it should be supplemented with gravel, if possible.

**SPONTANEOUS COMBUSTION OF COAL CARGOES.**—Some interesting points were brought out at a late inquiry in Liverpool into the burning of the *Flora* in the Indian ocean last August. The court, in giving judgment, held that the destruction of the vessel was entirely owing to the spontaneous combustion of the cargo. There was no evidence before the court, although strict inquiry was made on this point, tending to show that any water had reached the cargo before the 19th of August, when the hose was played over the heated coal. The court could not discover any cause for the outbreak of the fire. As far as the ventilation of the vessel went, it seemed to have been adopted after consideration, as the best and most effective mode of carrying such a cargo in safety. But one experienced ship-master expressed a doubt as to the system adopted, and was inclined to think that the laying of the platform on the bottom of the hold was a mistake, causing too much ventilation, though this was done at the instance of those interested in the insurance of the vessel. The court had before it the "Report of the Royal Commission on the Spontaneous Combustion of Coal in Ships," and was inclined to think that the "surface ventilation" recommended by the commissioners was highly desirable, and to concur strongly in their recommendations that the thermometer should be constantly used and daily registered in their log book.

**How to MAKE PARISIAN COPYING INK.**—The best kinds of copying inks are, as is well known, prepared by adding a percentage of alum, sugar and glycerine or salt to the extract of logwood. Such inks have a violet tint, and gradually become blacker on paper. The copy is, however, very pale at first, and is often indistinct. The Parisian copying ink is distinguished from the common kinds by its appearance, more or less yellow in a liquid state, and by producing a distinct bluish black on paper. It has the additional advantage of preserving its fluidity, while the common kinds soon thicken. Prof. Ghini recommends the following method of preparing an ink which has all the advantages of the Parisian: A strong solution of logwood extract is treated with 1% of alum, and then with as much lime water, so that a permanent precipitate is formed. Some drops of weak chloride of lime are then added so that a perceptible bluish black color is attained, and hydrochloric acid is added by drops till a red solution is obtained. A little gum is then added with 0.5% of glycerine.

**TO BRIGHTEN IRON.**—The following method of brightening iron, which appears suitable for some of the less important parts of large clocks, is recommended by Boden. The articles to be brightened are, when taken from the forge or rolls, in the case of such articles as plate, wire, etc., placed in diluted sulphuric acid (1 to 20), where they remain for about an hour. This has the effect of cleansing them, and they are washed clean with water and dried with sawdust. They are then dipped for about a second in commercial nitrous acid, washed carefully, dried in sawdust, and rubbed clean. It is said that iron goods thus treated acquire, without undergoing any of the usual polishing operations, a bright surface having a white glance. Care should be taken by any one using the nitrous acid not to inhale the fumes.

**DRIVING AWAY RATS.**—Dr. T. C. Smith, of Salem, has made an important discovery—how to rid a building of rats. It is an improvement over the old method of burning the building. First he caught a rodent alive. Next he poured carbolic acid over his ratsnip and then sent him adrift. His brothers, sisters, distant relatives and acquaintances didn't admire the fragrant (?) odor, and concluded to leave for more agreeable quarters. The result was not a rat could be found about the place. Mr. Smith is a real genius and friend of humanity and unborn generations will yet rise up and bless his memory. Portland has a few rats and a fruitful field for testing the merits of Mr. Smith's discovery is presented. Who will try it?

**WATERTIGHT PAPER.**—Packing paper may be made watertight by dissolving 1.8 pounds of white soap in one quart of water, and in another quart 1.8 ounces of gum arabic, and 5.5 of glue. The paper is soaked in the mixture and hung up to dry.

**GUNPOWDER AND COAL.**—The amount of gunpowder consumed in the working of coal constitutes an important element in the cost. It has, says the *Investors' Guardian*, been estimated at one pound weight to the ton.

## GOOD HEALTH.

## Workshop Surgery.

The saving of lives in workshops often depends upon instantly checking the blood which flows from the wound which the operation receives. One of the best instruments known for stopping the blood from a wounded limb is called Esmerch's band. It is an elastic tube which may be passed around the limb as tightly as possible and then its ends hooked together by a handy clasp. This forms a perfect ligature. The *London Lancet* gives some practical rules which should be pasted up in every workshop and in every farm-house in the land:

Rule 1. When a leg or an arm is severely wounded there may be no bleeding; in this case raise the limb on a cushion above the level of the body, and carefully watch the wounded part, so that the first bleeding may be seen.

Rule 2. Should there be much bleeding, put on the elastic tube as soon as possible (see rule 3); but if you have not got the tube near, raise the limb as high as you can above the level of the body, and act as follows:

A. If blood seems to come smartly from one point, place your finger or thumb firmly on that point, and stop up the place from which the blood is coming.

B. If you cannot see whence the blood flows, then roll up your handkerchief or cap, and with it press firmly on the bleeding part, not forgetting to keep the limb raised up.

Note. In case of light bleeding, either of these means just given (rule 2, A and B) will generally be sufficient, the limb being kept raised up.

Rule 3. There is no difficulty whatever in putting on the elastic tube. Let the limb be held up as high as possible, then stretch the tube to the full; wind it while stretched round and round the bare limb, and fasten the hooks at the ends to each other.

Note. If bleeding still goes on after the tube has been put on, you may be sure it is not tight enough. You had better, therefore, with the limb still raised, take off the tube and apply it again more tightly than before.

Rule 4. The tube must be placed above the wounded part—that is, between it and the body.

A. When the leg or foot is injured, apply the tube just above the knee; if the knee or thigh be wounded, then place it higher up on the thigh.

B. If the hand or wrist be wounded, put on the tube below the elbow; if blood come from the elbow or arm, then put on the tube higher up near the shoulder.

Rule 5. If the limb be wounded so near the trunk that you cannot put on the tube, then you must do your best to stop the bleeding by one of the plans named in rule 2.

Rule 6. If the injured man has to be carried far, either to a hospital or to his home, bear in mind:

A. To keep him warm with clothing.

B. To keep the limb continuously raised on cushions.

C. To look out for bleeding.

D. Not to give too much brandy, especially if you have not been able to put on the tube.

## Trials of Life.

We start upon life's journey full of hope, full of gladness, and full of joyous ambition, confident in our own strength and in the support of friends and kindred stationed round about us, on whom we lean with great satisfaction; but as years pass on one of the outposts, the supports, falls; and then another and another, each succeeding year, leaving one or more the less. For a while we scarcely miss the acquaintances and friends of our childhood, for we have so many; but as time rolls on the number becomes so small that each additional loss makes a greater void. Father, mother, brothers, sisters, our old neighbors, all gone; the minister of our youth has grown gray before us—he, too, has passed away; and beyond a schoolmate here and another there, nothing is left to connect us with the times and the home of our childhood, and such a feeling of desolation comes over us that we are ready to sink in perfect helplessness and despair. To the old who may chance to read these lines, the suggestion is made, which, if wisely heeded, may save the body from sinking under the weighing load, and it is this: He who made us is the Father of us all, and the dispensations of this life are designed to prepare us the more certainly for a beautiful existence beyond the grave, and to enable us to make the transition with the least violence, and at the same time to train us to those habits of heart which will the more elevate us in the world beyond; he arranges that we shall learn to lean less on ourselves, less on others, and more on Himself, as the weary man leans on a staff; and the sooner we begin thus to lean the happier we shall be in time, and the more ready shall we find ourselves to take up the returnless journey without a murmur and without a sigh.—*Hall's Journal of Health.*

**INGROWING NAILS.**—One of the deserved punishments which people suffer from the folly of squeezing their feet into narrow shoes and boots is an ingrowing nail. Mr. South recommends the following treatment for its cure. First get rid of the narrow shoe, so that the toe may be unconfined, and the nail allowed to recover its proper breadth, which, however, it does not do very quickly. Then proceed to relieve the sore skin by the side of the nail of its pressure. It is of no use, however, merely to cut away the pressing nail even freely, and then to press a piece of lint under its edge, which is as painful as it is useless; for the nail, if it is not otherwise managed, will drop, in the course of a few days, upon the old spot, and again render it "angry." The proper treatment is thinning the whole length of the middle of the nail, from its root to its end as much as possible; and this is best done by scraping it perseveringly with the sharp edge of a piece of glass, again and again, till the middle of the nail be as thin as writing paper, and will readily bend under the pressure of the finger nail. This is, at first, a rather painful operation; but the scraping must be done with a light hand. As soon as the middle of the nail has been thus thinned, it yields to the upward pressure of the skin on its side edges, readily bends, and offers no further resistance. The sore place being no longer irritated by pressure, the "proud" flesh soon drops down, and the sore heals. If narrow shoes or boots be again used, the foolish wearer may expect a repetition of his plague.

**FISH AS BRAIN FOOD.**—The belief that fish is specially adapted to feed the brain, and that fish-eaters are therefore more intellectual than the average, does not find much favor with Dr. Beard, according to the *Popular Science Monthly*. He says that this "delusion is so utterly opposed to chemistry, to physiology, to history, and to common observation, that it is very naturally almost universally accepted by the American people. It was stated," he adds, "by the late Prof. Agassiz, who impulsively, and without previous consideration, apparently, as was his wont at times, made a statement to that effect before a committee on fisheries of the Massachusetts legislature. The statement was so novel, so one-sided, and so untrue, that it spread like the blue-glass delusion, and has become the accepted creed of the nation."



# MINING SCIENTIFIC PRESS

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SAN FRANCISCO:

Saturday Morning, Dec. 1, 1877.

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## The Week.

The week brings to us the annual day of Thanksgiving appointed by President and Governors, and at the same time the day on which every good citizen is supposed to eat turkey, if he never does it any other time of the year. In our own community this year, the day is marked more particularly by a parade of the working-men of the city, which bids fair as we write (Wednesday night), to pass off more peaceably than was at first anticipated, in view of recent events.

The rains, which it was hoped would continue to fall copiously this month, have held off for awhile, and some are dependent on that account, fearing a "dry year." It is too soon for any such fears as yet; let us rather hope for an abundant rainfall which shall make the farmers' hearts glad, and fill to the brim the reservoirs and ditches of the miners. The shortness of the water season last year has given the miners an opportunity to put their claims in such a condition as to utilize every inch that flows. The quartz miners will keep up their end of the load easily the coming year, and make such a total of hullion product as the Golden State has not seen for some time. The recent revival in mining stock circles in this city has called attention again to the mining interests of the coast, and the dull times which have so long prevailed will, perhaps, soon become among the memories of the past. It only needs work, good, earnest work, to develop the riches underground, and more perfect confidence being once established in mining as a legitimate investment, the whole coast will feel the benefits.

THE taxes on the net proceeds of the Comstock mines during the quarter ending September 30th, 1877, are now due and payable.

## Telephones in the Mines.

The telephone which has been placed in the Consolidated Virginia mine is doing its regular duty like any other part of the apparatus of the mine. It runs from the office down to the bottom of the shaft at the 1650-foot level. A fine copper wire is used which is insulated and covered with India rubber or gutta percha. The instrument operates perfectly and orders from the office to the bottom of the mine are transmitted distinctly. This saves a good many trips of the cages, and in case of an accident can be made of very great service. It will undoubtedly be introduced in nearly all the mines before long and replace the old bell and cord signal.

The instrument is being also utilized in the same region for other purposes. The *Enterprise* says: An instrument was attached to the wire leading from the office of the Virginia and Gold Hill Water Company, south B street, to the farthest point on said company's works, near the eastern shore of Lake Tahoe. This wire has heretofore been used for working a printing telegraph. Yesterday, however, Capt. Overton, Superintendent of the affairs of the company, took a telephone and started out along the line from this city. He was first heard from at the reservoir on the dividing ridge between American Flat and Washoe valley, some six miles from the city, he having there halted and connected his instrument with the wire. Every word that he spoke could be distinctly heard in the office here. He then went to Lake View on the further side of Washoe valley, near the foothills of the Sierras, and over 20 miles from this city, following the course of the wire. Again he connected with the wire and again he was as distinctly heard as though he had been but a few rods away. He climbed the mountains and was next heard talking from this end of the long tunnel that runs through the Spooner divide this side of Lake Tahoe. Finally he went to the station at the end of the line, 30 miles from the office in this city, and last evening was talking from that point—away up in the Sierras, where he says there is a foot of snow. When at the terminus every word could be as distinctly heard as one sitting in the Con. Virginia office can hear what is said on the 1550-foot level of the mine by means of the telephone in use there. Wires will probably yet be run from this city to the mills and big flumes up in the mountains; also to the mills on the Carson river.

This really practical invention will be of the greatest utility in the mining regions in the mountains, and will save expense in many ways. It is stated that sitting in the Consolidated Virginia office at Virginia, one may hear by the aid of the telephone the puffing of the compressed air engine, and the rattle and clatter of other machinery in the mine. This being the case, the *Eureka Republican* suggests that a telephone might be introduced into the several drifts and other places where men are at work, when a boss sitting snug in his office on the surface might readily count the pick strokes made or the blows struck on a drill in any part of the mine. Though a man only paused long enough to spit on his hands the little instrument would tell about it. It would make it rather rough on men inclined to "soldier." However, the men would probably soon carry all the telephones into one drift and take turns at keeping up a racket therein. It is hardly probable that the miners will take to the suggestion advanced, kindly.

## Rhizopods.

Prof. Joseph Leidy, the eminent comparative anatomist and microscopist, made his second visit to the West the past season, under the auspices of the Hayden survey. He made a careful exploration of the country about Fort Bridger, the Utah mountains and the Salt Lake basin, in search of rhizopods. He has been engaged for a long time on a memoir on this subject, which will eventually form one of the series of the quartos of the survey.

The rhizopods are the lowest and simplest forms of animals, mostly minute, and requiring high power of the microscope to distinguish their structure. While most of them construct shells of great beauty and variety, their soft part consists of a jelly-like substance. This the animal has the power of extending in threads or finger-like processes, which are used as organs of commotion and prehension, often branching. From the appearance of their temporary organs, resembling roots, the class of animals has received its name of rhizopoda, meaning, literally, root-footed. In compensation of the smallness of these creatures, they make up in numbers, and it is questionable whether any other class of animals exceed them in importance in the economy of nature. Geological evidence shows that they were the starting point of animal life in time, and their agency in rock making has not been exceeded by later, higher, and more visible forms. With the marine kind, known as foraminifera, we have been longest familiar. The beautiful, many-chambered shells of these—for the most part just visible to the naked eye—form a large portion of the ocean mud and the sands of the ocean shore. Shells of forami-

nifera likewise form the basis of miles of strata of limestone, such as the chalk of England, and the limestones of which Paris and the pyramids of Egypt are built. Fresh water rhizopods, though not so abundant as marine forms, are, nevertheless, very numerous. They mainly inhabit our lakes, ponds and standing waters, but they also swarm in sphagnum swamps, and ever live in newest earth. Prof. Leidy has devoted several years of study to the fresh water rhizopods of the eastern portion of our country, and his especial object in the past expedition was to investigate those which are to be found in the elevated regions of the Rocky mountains.

## The Exchequer and I. X. L.

We understand that a report has been forwarded to London to the directors of the Exchequer and I. X. L. mining companies which is unfavorable in its tenor. An expert was sent here from England to examine into the affairs of the company, and from what we hear the report gives a very bad history of past operations. Work at the mines has not by any means been profitable. It appears that the expert speaks in very strong terms about so much outside work being done in the shape of mills, hoisting works, etc., before developments in the mines warranted the outlay. Still, he advises the directors to continue prospecting the mines in an economical manner, in the hope of still finding something which will repay the large outlay already made, rather than abandon the whole enterprise.

The English companies owning these mines commenced work in this district, in Alpine county, some ten years ago. The first thing they started up was a tunnel at Bullion, which, after being run 1,800 feet, developed nothing of consequence, so that after four years work it was abandoned. One lode was found but the money gave out before the other was reached. Some six years ago the English companies bought the Exchequer and I. X. L. properties, but the results so far have been unsatisfactory. We understand that a large amount of money has been spent on the property, which in addition to the purchase money, makes the total spent by the companies in the district foot up to about £250,000.

They have very complete and extensive works. The hoisting works are first-class, as are the mills, of which there are two of 20 stamps each. One of these, we are told, has never been used, there being no ore to mill. There is also an O'Hara furnace on the property. These works have cost considerable, and the report referred to, we hear, suggests further explorations rather than abandon the property where there is such a desirable plant. We hear that the report states that the bulk of the ore in the mines will not average more than \$7 per ton, but there are a few tons of rich ruby ore, picked out now and then, which has been the reason why work has been kept along thus far.

Mr. Riotte, of this city, has also examined the property, and his report varies little from the other one. He says that an idea having been expressed that the ore at the mill contained enough silver but the furnace was at fault, he examined the matter and was convinced that the O'Hara furnace is perfectly capable of working the ores. The ore at the mill worked well but contained next to nothing. This coming from one of the inventors and patentees of the Stetefeldt furnace and one owning stock in the Stetefeldt furnace company, is a good compliment to the O'Hara furnace.

We hope, for the sake of the English investors, that matters are more favorable at the mine than the report infers. A large amount of money has been spent by them, for which they have received no returns, and it will be unfortunate should they be led to abandon the property after such expenditure. We have not seen the report which has been sent to the directors in London, but understand the tenor is as stated. If an opportunity offers we shall publish the report.

BULLION SHIPMENTS.—Since our last issue shipments of bullion from the prominent mines have been as follows: California, Nov. 21st, \$232,859.13; Northern Belle, 19th, \$3,768; Grand Prize, 23d, \$17,100; Manhattan, 12th, \$9,485.20; Con. Virginia, 20th, \$160,712.03; Tybo Con., 20th, \$11,018.13; Alps, 20th, \$1,664; Endowment, 24th, \$2,154.93; Northern Belle, 21st, \$4,109.42; Arizona, 21st, \$1,689.09; Martin White, \$15,721; Comanche, 21st, \$6,681.47; Manhattan, 24th, \$10,788.05; Alps, 27th, \$3,231; Northern Belle, 24th, \$5,754.10; Arizona, 26th, \$2,139.33.

THE San Francisco mint is the most productive institution of the kind in the world. Its coinage last year amounted to \$42,704,500 more than the aggregate production of the three largest mints in Great Britain.

It takes 80,000 feet of lumber per day to run the Consolidated Virginia and California mines. One-half of this goes down the old shaft and one-half through the C. & C. shaft. The total requirements are 2,400,000 feet per month.

By the aid of the newly introduced dryers the tailing mills will probably be enabled to run throughout the entire winter months.

## The Award to the Giant Powder Company.

The Committee in Class 30, at the late Mechanics' fair held in this city, have just submitted their detailed report, although the medals in the class were awarded some little time since. Among other things they award to the "Giant Powder Company the medal for excellence and variety of blasting powders." We have had an opportunity of examining the report, which is a very favorable one to the company and likely to attract considerable attention to the new Judson powder, manufactured by them, in parts of the world where it is not so well known as here. This powder has only recently been introduced and has been received with great favor for certain classes of work. Its principal use is on the large gravel claims. The shattering effect loosens and softens the materials, so that, when the water is put on, the dirt is washed away better. The black powder does not shatter so much but breaks the land up in large lumps and bowlders. The bank is jarred more in depth with the Judson powder and it softens the material.

The Committee visited the works of the company in Golden Gate park, and inspected the appliance and process of manufacture, witnessing also some experiments. In the report they state that the peculiarities of Giant powder are now pretty well known. By the suddenness and energy of its explosion it will produce effects in hard rock so much greater than ordinary powder that it has superseded the other almost everywhere. Moreover, since its shattering effects are not even dependent on its being placed in a confined space, it is available for purposes which an explosive requiring those conditions is not adapted. It is almost exempt from danger by fire, since it burns when lighted and explodes only by heavy and sharp shocks, such as are given by a percussion cap or hammer. For the blasting of soft materials, however, this suddenness of action and energy make it suitable even where its greater strength is reduced, as it is in the Giant powder "No. 2" and "No. 2 extra," made by the company for medium hard rock.

The Committee also state in reference to the new Judson powder made by the same company, that is another formidable rival to gunpowder. The product is made by a somewhat complex process, and contains only five per cent. of nitro-glycerine. The Judson powder, the Committee says, seems to combine in an eminent degree, the slower actions of gunpowder with the greater power and shattering effects of dynamite, making it a very useful explosive for soft materials while its price is the same as that of common blasting powder. This powder has recently been tried to great advantage on the Bantas branch of the Central Pacific railroad.

The Committee do not enter into the details of the methods by which the strength of each day's product is tested at the works. It may be briefly stated, however, that this is done by the compression, or shortening of a lead ingot on which the force of the explosive is tried, and is then carefully measured by means of callipers. The Committee saw these experiments, however, and give in their report the result of those tried in their presence as follows:

The first column of the table gives the distance to which a 30-pound ball was thrown from a mortar by a charge of 6.5 grammes of each kind of powder. The second column shows the reduction in length of an ingot of lead one inch high by equal charges of the powders in the testing machine. (The amount of reduction is given in thousandths of an inch.)

	Range of Ball.	Reduction in Length.—Inch.
	Feet.	
Giant Powder No. 1.....	653	0.798
Giant Powder No. 2, extra.....	591	0.623
Giant Powder No. 3.....	531	0.531
Judson Powder.....	350	0.416
Black Blasting Powder.....	47	0.200

In estimating the bearings of these results it must be remembered that as the testing apparatus is made for special use with quick-acting nitro-glycerine explosives, in which "windage" is of little consequence, the common black powder appears at a disadvantage that is due more to its mode of action than to its lack of strength. The short mortar used as well as the cast-iron projectile are frequently cracked by the Giant powder; while the shortness of the bore does not give the slow-acting powder time to bring its full force to bear. The Committee are of the opinion that the compression of the lead ingot affords a nearer approach to a fair comparison of maximum strength.

The Committee think that as the shattering effect of the Judson powder is, in the great majority of blasting operations, an unquestionable advantage, while it is as cheap as black powder, and the "liability to accident very much less," it seems likely that the Judson powder may prove as formidable a competitor to gunpowder in the blasting of soft materials as the Giant powder has been in the mining of hard rocks.

THE Silver Hill mining company are about to sink a new shaft at a point between 1,200 and 1,500 feet east of the present shaft. It will strike the ledge at a depth of about 2,000 feet.

WE have on hand an illustrated article from the pen of J. W. A. Wright, on the jumping bean or devil bean of Mexico, which will be published next week.



## HYDRAULIC MINING IN CALIFORNIA.\*

No. 8.

[By AUG. J. BOWIE, JR., A. B., Mining Engineer.]

## The Bowman Reservoir and Dams.

The Bowman dam, owing to its position, has been constructed by the North Bloomfield company with due reference to the possibilities of breaks occurring in the several other reservoirs east of it, and it is intended in any emergency to hold the drainage not only of its own watershed, but also in case of accident to withstand any rush of water from the reservoirs beyond it. It is the largest dam on the coast. The following detailed account of it was written for this paper by Mr. Hamilton Smith, Jr., C. E., who planned and constructed the dam.

This reservoir was designed for the supply of water during the dry season of the year for the Bloomfield hydraulic gravel mine, owned and operated by the North Bloomfield mining company.

It is located in a mountain valley, on the head waters of one of the branches of the Yuba river, in Nevada county, California, at an elevation of 5,400 feet above sea level.

It is fed from a gross catchment basin of 28.94 square miles. There are a number of other reservoirs owned by the Bloomfield and Eureka Lake companies on the same stream above the Bowman reservoir; the upper one of these is of large size, holding 630 million cubic feet of water. In ordinary seasons these upper reservoirs retain all the water flowing into them, hence the catchment basin of the Bowman is only about 22 square miles, except in years of large rainfall. The mean annual rain and snow fall at the Bowman dam has been 77.91 inches for the past five years, of which about 75 per cent. flows into the reservoir. Two dams are needed to impound the water. The main one, placed across the narrow gorge forming the outlet of the valley, has a maximum height of 100 feet (96½ feet above datum base line), and an extreme length on top of 425 feet. The smaller dam is placed across a gap near the mouth of the valley, has a maximum height of 54 feet and an extreme length on top of 210 feet. It is fitted with wasteways, and over it will be discharged all surplus water from the reservoir.

Ordinary high water mark will be fixed at a point four feet below the summit of the main dam, being coincident with the crest of the waste dam. At this height there will be impounded 845 million cubic feet of water, with a surface area of 502 acres. By placing temporary flush boards on the top of the waste dam, the water can be brought up to 95-foot line (above datum base), increasing the quantity of water stored to 920 million cubic feet.

The canyon or stream feeding the reservoir has a maximum flow during great freshets of from 5,000 to 7,000 cubic feet of water per second. The existence of other reservoirs higher up the stream adds to the danger from great floods, and therefore the Bowman dams have been designed to withstand not only the freshets in the canyon, but also any additional influx of water caused by breaking of upper dams.

## Description of Main Dam.

Sketch 1 shows a profile across the canyon, being a longitudinal section through the dam. Sketch 2 gives a cross section of the dam at its extreme height.

It rests on solid granite bedrock, which is sufficiently free from seams to prevent any considerable leakage through crevices in the rock.

The dam was built in the year 1872 to the height of 72 feet, as shown by sketches, being a timber crib formed of cedar and tamarac unhewn logs, firmly notched and bolted together, and solidly filled with loose stone of small size. A skin of pine planking spiked to the water face formed its water-tight lining. During the years 1875 and 1876 the dam was increased to the height of 96½ feet above datum line (100 feet extreme height) by filling in a stone embankment on the lower side of the old structure, faced with heavy walls of dry rubble stone of large size. The down stream face wall is 15 to 18 feet thick at the bottom, diminishing to six or eight feet at the top. Most of the face stone in this wall are of good size, weighing from three-fourths to four and one-half tons, and there are many stones of equal weight in the hacking. The lower portion of the wall is 17½ feet high, with a batter of 15 per cent. It is built of heavy stone with ranged horizontal beds and with the face stone tied to the backing with long iron clamps.

The upper portion of the wall is built with a slope of 45°, and the face stone is bedded on an angle of 22½°, thus dividing the angle between a horizontal bed and a bed at right angles to the face. No attempt at range work was made in this upper portion of the wall. Above the 68-foot line, ribs of flattened cedar eight inches thick are built into the up-stream face wall, and are tied to it by iron rods three-fourths inch diameter and five feet long. To these ribs a planked skin is firmly spiked. This planking is of heart sugar pine three inches

thick and eight inches wide, with planed edges fitted with an outgate similar to ship planking. The plank was put on nearly thoroughly seasoned, and swells sufficiently to make the face practically water-tight, without either battens over the joints or calking. The opening at the joints made by the outgate suck in small particles of vegetable matter, which take the place of calking to a great extent. At the bottom the plank is fitted closely to firm bedrock and calked with pine wedges. There will be three thicknesses of plank (nine inches in all) placed on the lower 25 feet, two thicknesses (six inches) on the next 35 feet, and one thickness on the upper 36 feet. From past experience it is believed that this planking will remain sufficiently sound 20 years at least, and then it can readily be replaced.

A culvert extends through the dam, as shown by sketch 2, through which the water is drawn from the reservoir. This culvert is built with heavy dry rubble foundation and

There are 55,000 cubic yards of material in the structure, weighing about 85,000 tons; the hydrostatic pressure, with the water line 95 feet above datum against a vertical plane of that height across the canyon at the dam site, will be 21,745 tons. The dam is V-shaped, with the vertex of the angle of 165° pointing up stream. This mode of construction adds somewhat to the stability.

The cost of the dam when completed\* will be \$132,000. The rather peculiar construction of this dam was due to the following causes: The stone cliffs in the vicinity of the dam are composed of an exceedingly hard granite with great numbers of short cross seams, thus making it most costly to quarry dimension stone of considerable size. The stone has rarely a good cleavage, and the cost of dressing it down to regular beds is hence great.

No limestone is to be found near by, and any lime used must needs have been transported to the work from a long distance. The cost of trans-

cessive cribs, are solidly filled with granite stones of various sizes, from several tons down to a few pounds. No sand or fine stone was used in this filling. A plank facing of three-inch heart sugar pine is spiked on the water face, making a water tight lining similar to that on the main dam. The crest of the dam is 92½ feet above datum line, being, as stated before, four feet lower than the summit of the main dam. In it are cut 28 waste ways, each four feet in width, and having a depth of seven feet below the crest. These wastes are closed when all danger from freshets is passed, with boards two inches thick, eight inches wide, four and one-half feet long, placed horizontally, and sliding to their places one above the other on the inclined slope of the water face. This style of gate, though the simplest form known, has been found by long experience to be the very best.

The weight of the dam is about 6,500 tons, and the hydrostatic pressure, with the water line at 95 feet above datum against a vertical plane of that height across its upper face, will be 2,571 tons.

It is believed that the structure is sufficiently stable to allow with safety a flood of 16,000 cubic feet of water per second to pass through the wastes and over its crest.

The water passing over the dam will fall on bare granite bedrock, and thence flows down a steep gorge. From past experience in the use of cedar timber, it is safe to assume that the life of this structure will be from 25 to 30 years, and possibly longer. Its cost has been \$15,000.

## Hydraulic Washing.

The tunnel or opening for the sluices having been completed, the sluices placed in position, lined, and rifles set, water is turned on in the pipes and work commences. The first work is started near the head of the sluice, and the mine opened from that point. As the banks are washed away, the bedrock cuts are driven towards the face of the work, and the sluices are advanced as required.

To cave the bank, one pipe is kept playing on the lower part of it, at an obtuse angle, cutting out the gravel, and a second stream of water is directed from another pipe on the opposite side, forming a cross-fire, which materially aids the undermining. Any surplus of water not used in the pipes is allowed to run over the banks. In well-regulated works all the water should be used through pipes, and none allowed to waste into the claim. When the dirt caves readily, one pipe should be employed to do the cutting, and the second pipe should be manipulated clearing away the debris caving.

In working a claim, the face of the bank should be kept square. Advantage should be taken of the corners when left, and under all circumstances avoid working into what is called a horse-shoe form. If the banks are kept square, more work can be accomplished in less time, at less expense, and with fewer accidents. On the other hand, where a cut is pushed rapidly ahead, and the work is not squared, the men at the pipes soon stand encircled by high banks; washing can no longer be prosecuted to advantage, and the lives of the miners are imperiled. The majority of accidents arising from caves have been caused by this style of work.

Where the banks are very high, to mine to advantage it is advisable to hydraulic the deposit in two benches. Banks over 150 feet in height are dangerous to work as a single bench.

At North Bloomfield and at Smartsville, they are working single benches 250 feet high. When a cave is coming, to avoid the sliding of the great detrital accumulations, the water should be turned away from the falling masses, and the dirt will not run any distance; but if it is allowed to remain on the bank, a rush of water and debris ensues, and the men at the pipe have frequently to run for their lives. Such occurrences, arising either from carelessness or accident, cause a loss of time, and frequently entail damage to the pipe and machines.

Caves, when practicable, are generally made towards evening, and the night shift runs them off. Locomotive reflectors or fires of pitchwood are used to illuminate the banks during the night. The introduction of the electric light may ultimately be found serviceable.

In well conducted claims the washing should be continuous, and no water allowed to run to waste. It is, therefore, requisite to have several faces or openings, so that the water can be used from time to time on them, whilst the cuts are being advanced and the sluices lengthened. These cuts or "ground sluices," are mere trenches made in the bedrock towards the face of the bank washed, for the purpose of collecting the water and material, conveying them to the sluices. As a protection against theft, the sluices of claims worked intermittently are run full of gravel before turning off the water.

The length of runs in gravel claims is dependent on circumstances. Some claims clean up every 20 days or month, others run two to three months, whilst some only clean up every season after the water supply has ceased. In point of economy, the fewer clean-ups the better.

JOHN TOME of Eureka, Nevada, has made a contract with some coal burners near Alpha, to burn and deliver 250,000 bushels of coal during the next four months. He also purchased some valuable wood ranches upon which he intends to work 100 men this winter.

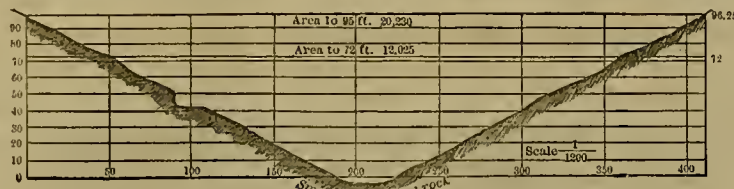


FIG. 1. SECTION ACROSS CANYON THROUGH MAIN BOWMAN DAM.

walls, and is covered with granite slabs, 16 to 18 inches thick and six and a third feet long. Three wrought iron pipes of No. 12 iron, each 18 inches in diameter, pass through the water face of the dam, as shown by sketch 2. Their upper mouths are protected by a strainer formed of two-inch plank, anchored to the bedrock. A separate valve or gate is placed at the lower end of each pipe; the water passing through the gates, aggregating a flow of 280 cubic feet per second when the three are open, discharges into a covered timber sluice seven

port would have been so great as to render the use of lime impracticable.

On the side of the mountain, at the distance of about one mile from the dam, there was a large pile of loose stone, the result of centuries of disintegration of the cliffs above. This stone was too irregular in shape to be used in wall building, but of good quality for an embankment. It was much cheaper to build a tramway to this stone already quarried by nature, load it on cars, and haul it to the work than to quarry a smaller quantity from the cliffs nearer the dam.

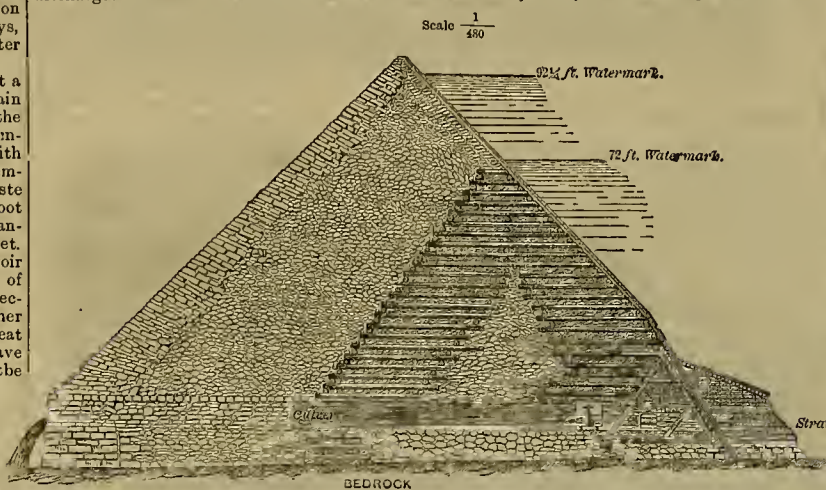


FIG. 2. SECTION THROUGH MAIN DAM AT DEEPEST POINT.

and one-half feet wide, one and three-fourths feet high, passing to the lower edge of the dam, and discharges on the solid bed-rock of the creek bed. The gates are approached by a man-way above the sluice. The crest of the dam will be formed by a coping of hewn heart cedar timbers 18 inches wide on top, and anchored securely by iron bolts to the stone wall below.

It is not probable that any water will ever pass over the crest of the main dam, but should a break occur at the large reservoir higher up the stream when the waste gates at the waste dam are closed, the difference in level between

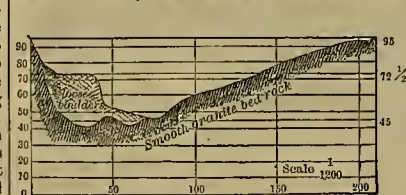


FIG. 3. Section across Ravine through Waste Dam.

the crest of the main and the waste dams might be insufficient to allow the resulting flood to pass over the waste dam. Additional care was, therefore, taken in building the down-stream face wall of the main dam, so that it can in any such possible emergency resist without injury a large stream of water passing over the crest. Should this happen a large quantity of water would enter the structure, owing to the inclined beds of the face stone and the flat slope of the wall, which would seek its discharge through the interstices purposely left in the nearly vertical portion of the lower wall. To prevent the consequent hydrostatic pressure, which would accumulate at the base of the dam to perhaps 20 pounds to the square inch, from forcing out the lower face of the wall, it was carefully built and tied with iron rods, as before described.

Hence, the supply of material being abundant, the flat slopes of 45° for the wall were adopted, which allowed with safety very much lighter face walls to be used than would have been the case had they been more vertical.

The stone for the wall as built was quarried from solid rock and cost in place per cubic yard three or four times more than the loose stone brought from the mountain side. When in the future the timber logs forming the cribs in the original

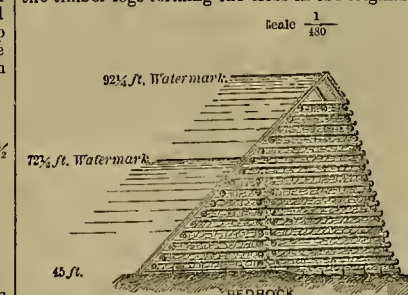


FIG. 4. Section through Waste Dam.

72-foot dam decay, there will be some slight subsidence of superincumbent stone. The depth of the stone is so considerable and the slopes of the walls so flat that it is believed this subsidence will not be noticeable.

## Description of the Waste Dam.

Sketches 3 and 4 show longitudinal and cross sections of the dam. It is a crib of round cedar timbers, varying from 12 to 30 inches in diameter, notched down to heart wood at the joints, and firmly bolted with three-quarter and one inch long drift bolts, with the foundation logs fastened to the bedrock with one-and-a-half-inch iron dowels. The crib, or rather the auc-

\* Up to December 31st, 1876, \$126,000 had been expended on its construction, and the remaining \$6,000 necessary to complete the work will be expended during the year 1877.

\* A paper read before the American Institute of Mining Engineers of the Wilkes-Barre meeting, May, 1877.

† The main dam was not quite finished in 1876, to being deemed advisable to allow a large stream of water 50 to 75 cubic feet per second, to flow over the present summit of the stone at 85 feet above datum, and to percolate through the stone embankment, in which some sand and finely mixed stone are mixed. This will finally settle the structure, and then the top courses for the crest will be put in place.



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The shrewdest and most experienced Inventors are found among our most steadfast friends and patrons, who fully appreciate our advantages in bringing valuable inventions to the notice of the public through the columns of our widely circulated, first-class journals—thereby facilitating their introduction, sale and popularity.

## Foreign Patents.

In addition to American Patents, we secure, with the assistance of co-operative agents, claims in all foreign countries which grant Patents, including Great Britain, France, Belgium, Prussia, Austria, Baden, Peru, Russia, Spain, British India, Saxony, British Columbia, Canada, Norway, Sweden, Mexico, Victoria, Brazil, Bavaria, Holland, Denmark, Italy, Portugal, Cuba, Roman States, Wurtemberg, New Zealand, New South Wales, Queensland, Tasmania, Brazil, New Granada, Chile, Argentine Republic, AND EVERY COUNTRY IN THE WORLD where Patents are obtainable.

No models are required in European countries, but the drawings and specifications should be prepared with thoroughness, by able persons who are familiar with the requirements and changes of foreign patent laws—agents who are reliable and permanently established.

Our schedule price for obtaining foreign patents, in all cases, will always be as low, and in some instances lower, than those of any other responsible agency.

We can and do get foreign patents for inventors in the Pacific States from two to six months (according to the location of the country) SOONER than any other agents.

The principal portion of the patent business of this coast has been done, and is still being done, through our agency. We are familiar with, and have full records, of all former cases, and can more correctly judge of the value and patentability of inventions discovered here than any other agents.

Situated so remote from the seat of government, delays are even more dangerous to the inventors of the Pacific Coast than to applicants in the Eastern States. Valuable patents may be lost by extra time consumed in transmitting specifications from Eastern agencies back to this coast for the signature of the inventor.

## Confidential.

We take great pains to preserve secrecy in all confidential matters, and applicants for patents can rest assured that their communications and business transactions will be held strictly confidential by us. Circulars free

## Home Counsel.

Our long experience in obtaining patents for Inventors on this Coast has familiarized us with the character of most of the inventions already patented; hence we are frequently able to save our patrons the cost of a fruitless application by pointing to them the same thing already covered by a patent. We are always free to advise applicants of any knowledge we have of previous applicants which will interfere with their obtaining a patent.

We invite the acquaintance of all parties connected with inventions and patent right business, believing that the mutual conference of legitimate business and professional men is mutual gain. Parties in doubt in regard to their rights as assignees of patents or purchasers of patented articles, can often receive advice of importance to them from a short call at our office.

Remittances of money, made by individual inventors to the Government, sometimes miscarry, and it has repeatedly happened that applicants have not only lost their money, but their inventions also, from this cause and consequent delay. We hold ourselves responsible for all fees entrusted to our agency.

## Engravings.

We have superior artists in our own office, and all facilities for producing fine and satisfactory illustrations of inventions and machinery, for newspaper, book, circular and other printed illustrations, and are always ready to assist patrons in bringing their valuable discoveries into practical and profitable use.

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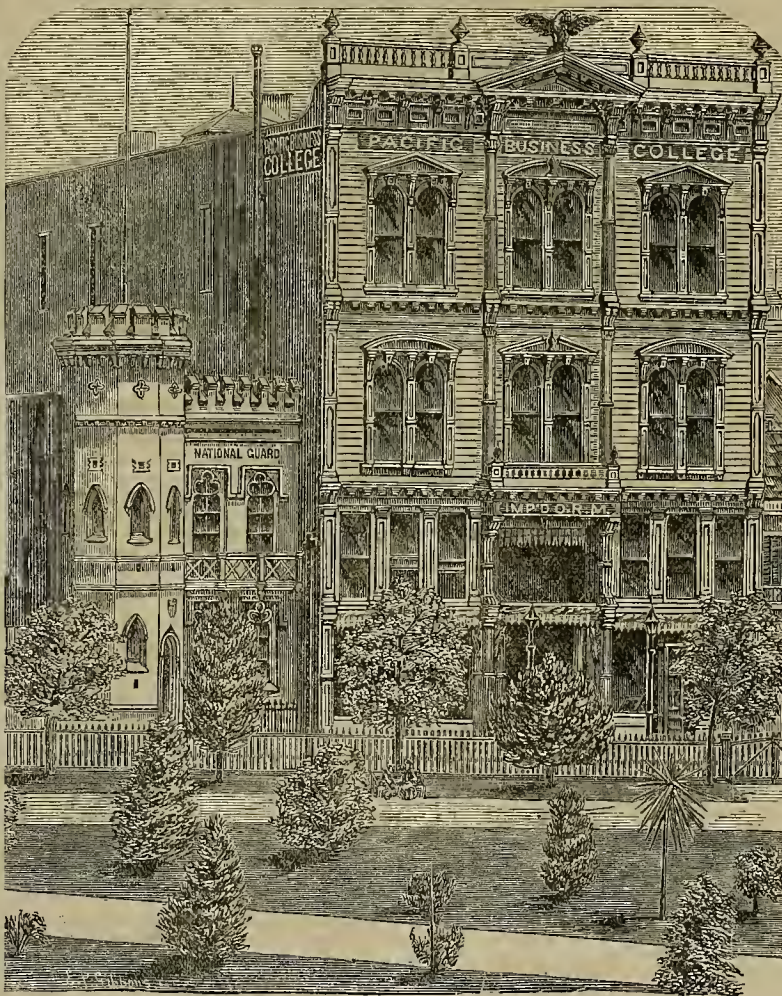
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## REFERENCES:

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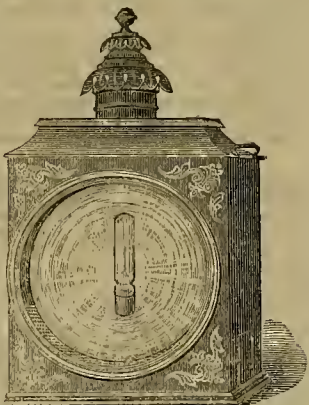
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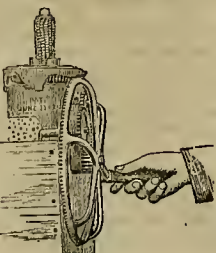
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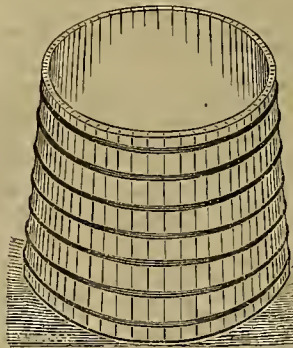
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## TAXES.

1877-1878.

Notice is hereby given, that a certified copy of the Assessment Book of the Taxable Property of the City and County of San Francisco, Real Estate and Personal Property (Subsequent Assessment Book included), for the Fiscal Year 1877-78, has this day been received; that the State, City and County TAXES for said fiscal year are now due and payable at the office of the undersigned, Room No. 1, City Hall, and the Laws in regard to their collection will be strictly enforced.

Taxes will become delinquent on the FIRST MONDAY in January, 1878, and unless paid prior thereto, Five per cent. will be added to the amount thereof.

WM. FORD,

Tax Collector of the City and County of San Francisco.

SAN FRANCISCO, October 22, 1877.

## Montgomery Avenue Tax.

Notice is hereby given that a certified copy of the Assessment Book of Real Estate, which is subject to Assessment to defray expenses incurred by the opening of Montgomery Avenue, has this day been placed in my hands to collect Taxes thereon.

Said taxes are for the Fiscal Year 1877-78, and are now due and payable at the office of the undersigned, Room No. 1, City Hall. All Taxes remaining unpaid on the FIRST MONDAY of January, 1878, will have Five per cent. added thereto.

WM. FORD,

Tax Collector for the City and County of San Francisco.

SAN FRANCISCO, October 22, 1877.

## ASSESSMENT OF LANDS

## Benefited by Widening Dupont St.

Notice is hereby given, that a certified copy of the Assessment Book of the Real Estate which is subject for the payment of Principal and Interest upon "Dupont-Street Bonds," as directed by an Act of the Legislature of California to authorize the Widening of Dupont Street in the City of San Francisco, "Approved March 23, A. D. 1876," has this day been placed in my hands for collection. The Laws in regard to the collection of the same will be strictly enforced.

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## PATENTS AND INVENTIONS.

### List of U. S. Patents Issued to Pacific Coast Inventors.

[FROM OFFICIAL REPORTS FOR THE MINING AND SCIENTIFIC PRESS, DEWEY & CO., PUBLISHERS AND U. S. AND FOREIGN PATENT AGENTS.]

By Special Dispatch from Washington, D. C.

WEEK ENDING NOVEMBER 13TH.

SASH HOLDER.—Ives Scoville, Oakland, Cal.  
SEWER TRAP.—John H. Mackie, Oakland, Cal.  
WHEEL CULTIVATOR.—Irvin Macy and John C. Watkins, Harrisburg, Oregon.

SECTIONAL CHIMNEY.—Leonard E. Clawson, S. F.  
LEATHER SPLITTING MACHINE.—Horatio N. Cook, S. F.  
DEVICE FOR PERFORATING ARTESIAN WELL TUBES.—John M. Greal, Los Angeles, Cal.  
TINNER'S MACHINE STAND.—W. Dale, San Lorenzo, Cal.  
HORSE HAY FORK.—Byron Jackson, Woodland, Cal.  
AMALGAMATING PAN.—Guido Kustel and Ottokar Hofmann, S. F.  
GANG PLOW.—Charles Lowrey, Stockton, Cal.

#### TRADE MARKS.

SALT.—Balfour, Guthrie & Co., S. F.  
MANUFACTURED WIRE IN THE COIL.—A. S. Hallidie, S. F.  
—The patents are not ready for delivery by the Patent Office until some 14 days after the date of issue.

NOTE.—Copies of U. S. and Foreign Patents furnished by DEWEY & CO., in the shortest time possible (by telegraph or otherwise) at the lowest rates. All patent business for Pacific coast inventors transacted with perfect security and in the shortest possible time.

### Notices of Recent Patents.

Among the patents recently obtained through Dewey & Co.'s SCIENTIFIC PRESS American and Foreign Patent Agency, the following are worthy of mention:

**DREDGING APPARATUS.**—Ezra F. Dennison, S. F. This improved dredging machine is especially intended for raising mud from the bottom of a river, lake or bay, and conducting it to a distance from the dredging machine for the purpose of depositing it either upon land or in water. It is more especially intended as a levee building machine. It takes the mud and heavy material which forms the bottoms of bays and water courses, and deposits it in a line along the bank, so as to form a levee or embankment for reclamation purposes. The invention consists in the employment of one or more steam vacuum pumps, located on a suitable platform or vessel, and connected with a pressure or reservoir tank, into which the material is delivered by the pumps. A flexible floating pipe of peculiar construction connects the pressure or reservoir tanks with the place where the material is to be delivered, and serves to conduct the material away from the tank to any desirable point. It also consists in a peculiar method of operating the valves, which alternately deliver steam and water to the vacuum cylinders.

**SHAFT COUPLING.**—Napoleon Beauregard, S. F. The first part of this invention relates to an improved clutch for connecting and disconnecting the meeting ends of line shafting. The improvement consists in providing an arrangement in connection with an ordinary interlocking clutch, by which the parts of the clutch can be automatically thrown out of gear and the two shafts disconnected while the shafting is in motion and under strain. The second part of the invention relates to a novel bearing for supporting the end of the line shaft upon which the shifting clutch is placed. The principal use for which these inventions are intended is in connection with the line shafting of rolling mills, but they can also be applied wherever it is desirable. The arrangement is claimed to be quite simple and effective.

**SKEWER PULLER.**—Will & Finck, S. F. The appliance patented by this firm is an implement for withdrawing skewers from cooked meats and replacing them after a portion of the meat has been cut off. The operation of pulling the skewers out of a cooked roast is quite simple and can be performed with any ordinary implement, but in order to preserve the roast in a slightly and presentable form the skewers must be replaced after a portion of the meat has been cut away. This implement, however, is intended both for pulling the skewer and inserting it into the cooked roast. It forms an additional implement for a set of carvers and provides the means for keeping a roast in a slightly condition until it is entirely cut up.

**EXCAVATING MACHINE.**—J. H. McMurphy, Merced, Merced county, and E. W. Chapman, S. F. This invention relates to that class of ditching and excavating machines in which a plow is arranged to turn the earth into an elevator which is formed on the periphery of the large wheel, so that the rotation of the wheel will lift the earth and deposit it either in a box or upon an endless belt or draper. The improvements consist in a peculiar construction of the elevating wheel and in the arrangement of the different parts of the machine. With the improved machine they can raise earth and convey it to a distance with facility, and it will be specially useful for making ditches and canals where the earth excavated is to be used for forming an embankment.

**WINDMILL.**—A. M. Abbott, Stockton. This improvement in windmills consists in a means for producing a direct vertical motion of the rod or pitman, which extends from the crank

through the turn-table of the mill, so that there will be no motion of the rod from side to side. This enables the inventor to employ a novel construction for the turn-table, which is of very small size, so that the wheel can be placed close to it, and near its vertical axis of revolution. The invention further consists in a cheap, strong and novel construction for the frame of the mill.

**PRIZE MEDAL OIL.**—(Trade Mark.) A. C. Deitz & Co. This trade mark consists of the words, "Prize Medal Oil" arranged above and below the figures "1876." The essential feature of the trade mark is the words "prize medal." The firm has used it on vessels, cans or cases containing kerosene oil.

### A Plea for the Sinews.

It is drawing near this close of the year. An unusually large amount of money stands due us from subscribers. We need this money for present use in the carrying on of our business. We are hating as vigorously as ever in the struggle to publish a journal which shall be unsurpassed in its truth, enterprise and usefulness—but to carry on the war we must have the sinews already pledged to us.

There are several reasons why we make the appeal. First, there are some subscribers who are absolutely unable to pay, because they have produced nothing this year. This load, which circumstances force us to carry, should be recognized by all those who can just as well pay us as not, but who either forget or neglect to help us with their dues. Every such one ought not to pass a day without forwarding to us the trifles which each owes, but which, in the aggregate, comprise just the resources which should be available to us at this time. We hope this kindly but will call out action from those who are in our debt, and that we shall speedily receive payments which will not impoverish them, but make us rich indeed in ability to meet the growing requirements upon us.

We have not suffered our journal to show any signs of a "dry year," because we put faith in those whose subscriptions we had. We do not believe in backward steps in journalism. We began the year with a large expenditure for new type, the benefit of which all readers have enjoyed. We were forced by circumstances to incur the expense of removing our publication offices. We have undertaken outlay in the increase of our engraving facilities, the advantage of which will appear clearly in the future. We have expended more money in many ways necessary to the improvement and increased usefulness of our paper. These forward steps we do not regret; they are necessary to our progress. But the taking of them throws an obligation upon those who are profited by our work, to stand abreast of us in our efforts and help us with what is rightly ours, and which we greatly need.

It is hardly necessary for us to allude to the claims which the MINING AND SCIENTIFIC PRESS has upon the mining community and industrial classes on this coast. We believe honestly that the paper has done a great deal to advance the mining interests on this side of the continent, and in so doing has enhanced the value of mining property by bringing it before the people. We have endeavored and shall continue to endeavor to give to our readers every item of interest possible which will aid them in their business and at the same time show to the public what is being done from week to week in the interests we represent.

This being the case, there is no reason why our friends should forget us when we never cease to remember them. Our readers must surely desire to help a paper of which they approve and which helps them, so they should not delay to forward us what is our due.

**PERSONAL.**—The Cincinnati *Enquirer*, alluding to Miss Anna Dickinson and her illness, says the following good words: "It is not strange. That powerful feminine brain has been ceaselessly active from her girlhood. Since, as a slight Philadelphia girl, she paid her first quarter of a dollar to hear Wendell Phillips lecture, she has lived a life wedded fast to the intellect. The most eloquent female platform speaker among women—novelist, dramatist and actress, as well—her rare versatile faculties have been constantly overworked. No woman of this generation has accomplished so much, or has ventured upon such varied fields with such success. This illness may prove a blessing in being a warning. She has added something to every art she has touched and she has touched the highest. Everybody hopes that her present illness will not interfere with her engagements for this winter to entertain the public."

A MEETING will be held on the 19th of December to choose one or more assignees of the estate of the Pioneer Savings and Loan Bank. In the meantime creditors will appear before Register Gitchell to prove up their claims.

GEN. SHERMAN has testified before the House Military Committee that the present military force on the border is insufficient to protect the lives and property of citizens, and recommends its increase.

THE Central Pacific railroad company is paying its taxes. At Reno it paid \$13,264.93 to Washoe county; at Winnemucca it paid \$35,760.40 to Humboldt county.

### News in Brief.

GENERAL GRANT will go from Athens to Alexandria and Cairo.

THERE is great mortality from typhoid fever in the vicinity of Watsonville.

THE schooners *Albert* and *Edward* was lost on the Mendocino coast, this week.

ONE of the notorious Davenport brothers, slight-of-hand performers, is dead.

AN attempt to break out of the Los Angeles jail was frustrated on Monday night.

THE "New England Club of the Pacific Coast" has been organized in this city.

THEY had several successive earthquake shocks in Mendocino and Humboldt counties this week.

A BRITISH man-of-war is to be stationed at the Hawaiian Islands, to look after British interests.

MRS. GEO. H. THOMPSON, sister of Senator Sargent, of California has committed suicide at Lowell, Mass.

MR. STEPHEN FIELD, the electrician, returned from a trip to Europe and the Eastern States last Saturday evening.

WM. SMITH, of the well known hanking firm of Rideout & Smith, Marysville, has disposed of his interest to his partner.

THE New York *Tribune* says the Silver bill has no prospect of reaching the President during the present session of Congress.

THE *City of Peking* brought as a part of her cargo the enormous consignment of 100 tons of silk-worm eggs for Italy from Hongkong.

MR. MILTON S. LATHAM, of the London and San Francisco Bank, is still confined to his bed. The utmost care is taken, as his disease is a dangerous one.

THE United States Grand Jury in this city has concluded its labors. The number of indictments found is 34, most of them for cutting timber on Government land and defrauding the revenue.

THE United States steamer *Lackawanna* will leave in the early part of the next month for the southern coast for the purpose of surveying the reef upon which the *City of San Francisco* was wrecked.

THE Mexican war steamer *Mexico*, now in San Diego bay may come to this port, her commander having telegraphed to his superiors for permission to do so that the vessel may go into a dry dock for repairs.

SAMUEL G. PIERCE, who died in Oakland last week, was the author of the Constitution of California, and a veteran of the Mexican war. He served in company F, 47th artillery, under General (then Colonel) Sherman.

LATE news from Chile represents Paraff, of oleomargarine fame, to be incarcerated in prison at Santiago, owing to his "reactivo" swindle. His assistant has shared the same fate. The latter is represented to have been at one time doing business in this city as a jeweler.

It is reported that the Sultan, sorely pressed and finding no decided and reliable friend in any of the European nations, but having, alone and unaided, to meet the hosts of Russia, thus without funds, and friends has determined to enter upon negotiations for peace directly with the Czar.

A SPECIAL from Matamoras, Mexico, says the troops which left the City of Mexico some days ago under command of Trevino, for the Rio Grande, are not to repel the United States troops, but to co-operate with the United States authorities in maintaining peace between the two countries.

THE fishermen of Collinsville are about to organize a Fishermen's Association, and send delegates to confer with the Fish Commissioners to fix the time for the spawning and protection of the fish in the bays and rivers of our State satisfactorily to all concerned, and then to pledge themselves to live up to the law and protect the fish at all hazards.

LAST Friday afternoon a letter was received in this city, addressed to the wife of Nelson H. Mowry, the champion long-distance rider and leader of the California Polo Club, announcing that Mowry died at New Orleans on the 7th inst. of yellow fever, after a few day's illness. "Nell," as he was familiarly called, was a splendid specimen of manhood, and at the time of his death was 37 years of age.

MESSRS. Pond, Leveridge & Brown are about to build a large and extensive fish cannery at Collinsville, on the Sacramento river. The main building is to be 150x50 feet, with a wing 60x40 feet for a bath and engine room, and is to contain all the modern improvements known in the salmon canning business. The firm have already made all their arrangements and contracted for their fish for the coming season.

A cablegram gives an account of the reception given by Mrs. John W. Mackey to General Grant at the Mackey villa in Paris. The residence and furniture, which cost 2,000,000 francs or \$400,000, is said to be one of the best appointed houses in the French capital, and the private receptions of Mr. and Mrs. Mackey during the past year have not only been largely attended by Americans, but also by leading Europeans. Mr. Mackey, who is at present in this city, will return to Paris in about a month.

THE Indians are raiding the ranches in the Black Hills.

THE Winnemucca water works have been completed.

THE citizens of Berkeley, are again discussing the advisability of consolidating with Oakland.

THE Public Schools of Nevada city are crowded to their utmost capacity. More school room is required.

THE New York *World's* Washington special says that Russell Hastings, of Cleveland, Ohio, will succeed McCormick as Assistant Secretary of the Treasury.

THE Legislature will be called upon this session to restrict the fare on street cars in this city of five cents, instead of six and one-fourth cents as at present.

A FEARFUL gale raged around the British Isles on Saturday night. Thirty vessels are ashore between Ramsgate and Deal, and many lives are reported lost.

REV. HUGH SMITH CARPENTER, formerly of San Francisco, who has lately taken charge of the Bedford Congregational church, Brooklyn, preached on Sunday and is well spoken of.

RECENT reports said to be in circulation in San Francisco to the effect that sickness prevails in Santa Barbara, are erroneous. No epidemic prevails, and the place is clean and healthy.

THE revenue steamer *Shubrick* has placed in position in 20 fathoms of water outside the heads one of Courtney's automatic buoys. In ordinary weather these buoys can be heard three miles off.

THE Government of Colombia has made a contract with an Englishman named Ross for the construction of the Central railroad for \$20,000,000. Panama subscribers \$250,000 per annum as a subsidy, it is reported.

An order has been issued calling out 150,000 of the civic guards in Constantinople and provinces, to maintain order during the possible absence of the regular forces. Christians are summoned to participate in this levy.

DISPATCHES from New York, state that it is painfully evident that the trade and industry of the country await the possibility of financial disturbance by Congressional legislation, enough to cause great stagnation.

TRICKETT, the Australian champion oarsman, having challenged the world to a three-mile race for £1,000, to be rowed in any country, Courtney accepts, to row in the United States, for this amount or more, and will pay Trickett's expenses to this country in the event of Trickett's defeat.

LAST fall two Oneida Indians voted at Oneida, New York, and were arrested on the charge of illegal voting. It was claimed that Indians had no right to vote, and the two Oneidas were indicted and tried before Judge Wallace, at Utica. The Judge decided that the Oneidas are entitled to vote, and at the November election a number of them did vote.

THE Ambassador of the Samoan government, M. K. Lamamen, with his associate, James Guthrie, arrived in Washington, Monday, and will have a conference with the Secretary of State. The object of the Ambassador is to negotiate with the United States a treaty of friendship and commerce, thus securing recognition as an independent nation.

AT Stillwater, the headquarters of the Piute Indians, in Nevada a strange disease has broken out among the Indians. A large number of them at that place are effected with a swelling of the toes and fingers, which besides being very painful renders them utterly helpless. The disease seems to be epidemic amongst the Indians.

THE *Soleil* says: Another dissolution, if voted by the Senate, would complicate instead of solving the crisis. The *Republic Francis* demands the withdrawal of the new Cabinet and renews its argument in favor of the Congress of the two houses to definitely settle open constitutional questions. Several conservative papers say that the Government will call upon the Senate to declare openly for or against it.

THE refrigerator slaughter house at Winnemucca station has commenced dressing beef for shipment. This enterprise bids fair to result in great benefits to the community at large, as well as to stock raisers. Its success will make Winnemucca the great meat shipping station for central and northern Nevada, eastern Oregon and western Idaho. It will make a home market for beef cattle and sheep; it will be of immense advantage to the owners of hay ranches along the Humboldt.

A NUMBER of cypher telegrams have recently passed between Senators Jones and Sharon on the subject of the present crisis in the Senate—Jones endeavoring to impress Sharon with the importance of leaving his business long enough to help his party out of the existing emergency. A dispatch has now been received from Sharon, saying that it is absolutely impossible for him to leave before December 20th, at the earliest. In reply to a representation of ill-feeling against him on the part of Republican Senators on account of his absence, he states that if any considerable number of his associates desire it, he will resign in time to have his successor chosen by the new Legislature of this winter.



Women as Mine Locators.

This following decision of the Commissioner of the General Land Office, published in the Eureka Republican, holds that women have equal rights with men in the location and holding of mining claims:

WASHINGTON, Nov. 13th, 1877.

Register and Receiver, Eureka, Nevada:

GENTLEMEN:—Referring to your letter of the 14th of September last, I have to state that Section 2319 of the Revised Statutes of the United States declare that the mineral lands of the United States shall be free and open to exploration and purchase "by citizens of the United States, and those who have declared their intention to become such, under regulations prescribed by law." The law makes no distinction in this regard on account of sex.

Mining claims may be located and held by either males or females upon compliance with law. Very respectfully, your obedient servant, J. A. WILLIAMSON, Commissioner.

This decision is perfectly just. We see no reason why a woman cannot claim and run a mine as well as a man. A good many women have been found to manage farms as well as the men have, and in some cases much better. On the farm, in fact, the burden of the home economy rests on the woman's shoulders, and it depends greatly on her whether there is a balance or a deficit at the end of this year's work. The women, however, have not had much opportunity to try their hands at managing mines, but seeing that men make so many failures in proportion to successes, perhaps an infusion of female economy into the business might be beneficial.

During the quicksilver excitement of a year or two ago in the coast counties of this State lots of farmers left the plow and took up the pick and shovel, roaming over the hills in search of cinnabar. These claims were found on the farming and woodlands where women could travel as well as men, and a good many claims were discovered by the gentler sex. Perhaps if quicksilver had kept up to an encouraging price we should have heard before this of several female mining superintendents, running their own property. There is no reason as far as we can see, why there should not be "bonanza queens" as well as "bonanza kings," and we hope to see a few one of these days.

HYDRAULIC MINING.—This article on this subject from the pen of the well-known engineer, Aug. J. Bowie, Jr., which is now being published in the PRESS, is an especially valuable one, and our hydraulic mining friends will find it alone worth more than a year's subscription to this PRESS. The facts and figures given by Mr. Bowie are of great value as showing the results of practical work. A reliable article of this kind is more profitable for miners to read and study than any other class of literature. We advise those who do not usually file away the PRESS to commence keeping their numbers now and they will have this standard article as a whole. It has been carefully revised and corrected by Mr. Bowie and comprises the whole literature of hydraulic mining in California.

THERE are 550 infants in the great National Baby Show, opened at New York Monday morning. Grand pianos make inaudible this melody of the babies.

THE Chief Signal Officer of the Army, in his annual report, recommends legislation for a more complete organization of the Signal Service.

TO QUERISTS.

In propounding questions to the editorial, patent or business departments of this office, letter writers should be careful to enclose a stamp and addressed envelope if they wish prompt answer. If we were to furnish time, paper, envelopes and stamps, all free to parties who address this office on matters of more interest to themselves than to us, FIVE HUNDRED DOLLARS A YEAR would not cover the expense. This hint, however, is not intended for parties writing in our own or the public interest, or who would be obliged to delay writing at any time for want of an extra stamp.

P. S.—Persons receiving this notice by letter will please take it kindly (under the fifth rib), and be sure to STAMP us—(but not too hard)—by return mail.

WOODWARD'S GARDENS has the following new attractions: The buffalo chase; large whale skeleton; new museum; improvements in the zoological department, besides the other features which have made it popular.

Signal Service Meteorological Report.

Week Ending November 27, 1877.

HIGHEST AND LOWEST BAROMETER.

Nov. 21 (Nov. 22) Nov. 23 Nov. 24 Nov. 25 Nov. 26 Nov. 27

30.10 30.11 30.21 30.34 30.33 30.12 30.98

30.05 30.02 30.08 30.95 30.18 29.95 29.02

MINIMUM AND MAXIMUM THERMOMETER.

68 63 61 59 64 67 69

51 52 55 51 51 53 56

MEAN DAILY HUMIDITY.

82 83 71 68 74 69 55

PREVAILING WIND.

SE SE W N N N NE

WIND—MILES TRAVELED.

129 108 221 172 157 51 110

STATE OF WEATHER.

Cloudy. Rain. Clear. Clear. Clear. Clear.

RAINFALL IN TWENTY-FOUR HOURS.

.13

Total rain during the season, from July 1, 1877, 2.24 in.

A VALUABLE MINING BOOK.

BY J. S. PHILLIPS.

The Explorers', Miners' and Metallurgists' Companion, 682 pages, 83 Illustrations. Second Edition. A California publication.

OPINIONS OF THE PRESS.

The book is exactly calculated to suit the views and meet the requirements of those for whom it has been written.—London Mining Journal.

The most practical and comprehensive work on mining subjects extant, and valuable book of reference.—Mining and Scientific Press, San Francisco.

We know of no work on these subjects in the English language at once so comprehensive, practical and intelligible.—S. F. Golden Era.

He has rendered to the leading industry of the coast a valuable service—has furnished the millman and miner a safe and much needed practical guide.—Overland Monthly.

This book, which treats in an intelligent and practical way on almost every topic connected with mining pursuits, should be in the hands of every millman, metallurgist, prospector and miner on the Pacific coast. Even the capitalist, and, in fact, every person already engaged in, or likely to become interested in the business of mining, will find in this comprehensive work an amount of information that they cannot afford to dispense with.—S. F. Commercial Herald.

This book is free from trash and solid throughout; all its matter is intelligible to men of ordinary education, and all of it is valuable to miners.—S. F. Daily Alta.

In the several sections the work is eminently practical. It is very comprehensive and contains a great deal of useful information which cannot be obtained from the previous books that have been written on these subjects.—S. F. Daily Examiner.

It affords a vast quantity of information as to the appearance and value of different ores.—S. F. News Letter.

It is the best single English treatise we know for the use of prospectors and practical miners.—The Engineering and Mining Journal, New York.

Sold by Dewey & Co., at this office. Price \$10.50.

Testing and Working Silver Ores.

This above is the title of an illustrated work of 114 pages, for miners and prospectors, by Chas. H. Aaron, which has just been issued by Dewey & Co. Mr. Aaron has managed to give many useful hints and suggestions, free from all technicalities, and in such a style as to be easily comprehended. It is written for the miner, with no chemical symbols or metallurgical technicalities to confuse those who are not chemists or metallurgists. The following summary of the contents of the work will give an idea of its scope:

Under the heading of the first chapter, "Testing Ore for Silver," we find paragraphs on ore formation test for silver, with heat and water, acid or blow pipe. In speaking of testing for a process, the extent and richness of ore is considered, smelting ores, selecting and working same, appliances for testing, roasting, etc. Under the head of "Working Ores" the author describes Aaron's process, has something to say of superheated steam, preparation of dichloride of copper and protochloride of copper, use of copper and iron, quantity of chemicals, carbonate of lime, chloride ores, amalgam, Patehen's process, etc. He also describes the method of working roasted ores, treatment of base metals, stirring, heat of furnace, want of sulphur, etc. Under the head of "Leaching Processes" are the titles, Smelting, Mexican process, Chilean process, Kroehnke's process, etc. Under "Pulverizing Machines" are described the astrata and its construction and operation, stamp batteries, screens, Crocker's trip-hammer battery, Paul's pulverizing barrel, Kendall's battery, Noise's pulverizer, a cheap rock breaker, etc.

In speaking of amalgamators the author describes a cheap amalgamator, grinding the ore, directions for making a barrel, preventing mechanical wear, use of quicksilver, copper in bars, Freiberg barrel, cheap barrel trough, barrel on rollers, Aaron's amalgamator, separator, etc.

He describes an improvised retort, roasting furnace, furnace tools and furnace building. Among the miscellaneous mention may be found Aaron's leaching apparatus, with two or three different arrangements, a small mill, sampling tallies and settling tanks, dichloride of copper, etc. Mr. Aaron is a practical miner, of long working experience on this coast.

The book is a serviceable one for miners and prospectors to use. Price, post free, \$2.00. Address Dewey & Co., MINING AND SCIENTIFIC PRESS, 202 Sansone Street, San Francisco.

UNITED STATES

Mineral Land Laws, Revised Statutes, AND INSTRUCTIONS AND FORMS UNDER THE SAME.

We have just issued a pamphlet containing the General Mineral Land Laws of the United States, with instructions of the Commissioner of the Land Office. The contents of this pamphlet comprise all of the Government laws with relation to mineral lands of interest to the mining community, as follows: Mining Statute of May 10th, 1872, with instructions by the Commissioner of the Land Office; Mining Statute of July 26th, 1866; Mining Statute of July 9th, 1870. Forms required under Mining Act of May 10th, 1872, as follows: Notice of Location; Request for Survey; Application for Patent; Proof of Posting Notice and Diagram of the Claim; Proof that Plat and Notice remained Posted on Claim during Time of Publication; Register's Certificate of Posting Notice for Sixty Days; Agreement of Publisher; Proof of Publication; Affidavit of \$500 Improvements; Statement and Charge of Fees; Proof of Ownership and Possession in Case of Loss or absence of Mining Records; Affidavit of Citizenship; Certificate that no Suit is Pending; Power of Attorney; Protest and Adverse Claim; Non-Mineral Affidavit; Proof that no Known Veins Exist in a Placer Claim, etc. There is also given the U. S. Coal Land Law and Regulations thereunder. The work comprises thirty pages, and will be sold, post-free, for 60 cents. It should be in the hands of every one having any mining interests. DEWEY & CO., Publishers of this MINING AND SCIENTIFIC PRESS, S. F.

Gold, Legal Tenders, Exchange, Etc.

[Corrected Weekly by SUTRO & Co.]

SAN FRANCISCO, November 28, 3 P. M.

LEGAL TENDERS in S. F., 11 A. M., 97 1/2 @ 98. SILVER, 4 1/2 @ 4 1/2.

GOLD in New York, 103.

GOLD BARS, \$30 @ 310. SILVER BARS, 6 @ 14 1/2 cent. dia. count.

EXCHANGE on New York, 1 1/2; on London bankers, 49 1/2; Commercial, 50; Paris, five francs 60 dollar; Mexican dollar, 55.

LONDON Consols, 95 3/4; Bonds, 106 1/2.

QUICKSILVER in S. F., by the flask, 1 lb. 46 1/2 @ 47c.

METALS.

[WHOLESALE.]

WEDNESDAY M., November 28, 1877.

IRON.—		
American Pig, ton.....	23 00	@ 32 00
Scottish Pig, ton.....	22 00	@ 33 00
White Pig, ton.....	22 00	@ 34 00
Oregon Pig, ton.....	22 00	@ 35 00
Refined Bar.....	3 1/2	@ 61
Horse Shoes, keg.....	5 00	@ 71
Nail Rod.....	—	@ 71
Norway, Oval.....	—	@ 71
Roller.....	—	@ 71
COPPER.—		
Copper Tinned.....	37	@ 40
Sheathing, B.....	27	@ 40
Sheathing, Yellow.....	21	@ 23 1/2
Sheathing, Old Yellow.....	10	@ 21
Composition Nails.....	21	@ 21
Composition Bolts.....	24	@ 21
STEEL.—		
English Cast, lb.....	14	@ 5
Anderson & Woods, ordinary sizes.....	16	@ 5
Do, do, do.....	16	@ 5
Flat Bar.....	15	@ 18 1/2
Plow Steel.....	8 1/2	@ 12
TIN PLATES.—		
10x14 Charcoal.....	8 50	@ 9 00
Bacon Tin.....	24	@ 24
Australian.....	19	@ 20
ZINC.—		
By the Cask.....	11	@ 11
Zinc Sheet, 7 1/2 x 10 lb.....	11	@ 11
7 1/2 x 11 to 14.....	11	@ 11
8 1/2 x 10.....	12	@ 12
8 1/2 x 11 to 10.....	12	@ 12
NAILS.—		
Assorted sizes.....	3 00	@ 3 25
QUICKSILVER.—		
By the lb.....	47 1/2	@ 50

GENERAL MERCHANDISE.

[WHOLESALE.]

TUESDAY, M., November 27, 1877.

BAGS.—Jobbing.		
Eng Standard Wheat, 9 @ 9 1/2	3 00	@ 3 25
Neville & Co's.....	3 00	@ 3 25
Hand Sewed, 22x36, 9 @ 9 1/2	3 25	@ 4 00
24x36.....	—	@ 4 00
Machine Sewed, 22x36.....	—	@ 4 00
Flour Sacks, halves.....	8 1/2	@ 10 1/2
Quarters.....	5 1/2	@ 10 1/2
Eighths.....	4 1/2	@ 10 1/2
Heaven, 60 lbs.....	8 1/2	@ 10 1/2
45 inch.....	8 1/2	@ 10 1/2
40 inch.....	—	@ 10 1/2
Wool Sacks.....	—	@ 10 1/2
Hand Sewed, 3 1/2 lb. 40 @ 9 1/2	80	@ 85
Machine Sewed.....	40	@ 85
4 lb.....	47 1/2	@ 85
Standard Gunnies.....	15 @ 16	@ 85
Bean Bags.....	6 @ 17	@ 85
CANDLES.—		
Crystal Wax.....	17 @ 17 1/2	@ 85
Eagle.....	14	@ 85
Patent Sperm.....	25 @ 30	@ 85
CANNED GOODS.—		
Assorted Pic Fruit.....	—	@ 85
2 1/2 lb cans.....	75 @ 80	@ 85
Table do.....	3 75 @ 25	@ 85
Jams and Jellies.....	4 25 @ 4	@ 85
Pickles, H. gal.....	3 50 @ 30	@ 85
Salmon, q.....	5 @ 90	@ 85
Ht Boxes.....	3 00 @ 2	@ 85
Preserved Beef.....	4 00 @ 2	@ 85
do Beef, 3 1/2 lb.....	5 50 @ 2	@ 85
Preserved Mutton.....	4 00 @ 2	@ 85
2 lb. doz.....	4 00 @ 2	@ 85
Beef Tongue.....	5 50 @ 2	@ 85
Preserved Ham.....	6 50 @ 2	@ 85
2 lb. doz.....	5 50 @ 2	@ 85
do Ham, 3 1/2 doz.....	3 00 @ 2	@ 85
do do.....	7 1/2 @ 80	@ 85
Coos Bay.....	6 50 @ 7 00	@ 85
Bellingham Bay.....	6 50 @ 7 00	@ 85
Seattle.....	7 00 @ 8	@ 85
Cambridge.....	14 00 @ 8	@ 85
Scotch.....	13 00 @ 8	@ 85
Scranton.....	13 00 @ 8	@ 85
Vancouver Id.....	7 50 @ 8	@ 85
Charcoal, sack.....	75 @ 8	@ 85
Coke, blk.....	90 @ 8	@ 85
COFFEE.—		
Sandwich Id.....	21 1/2 @ 20	@ 85
Costa Rica.....	18 @ 20	@ 85
Guatemala.....	13 @ 20	@ 85
Java.....	19 @ 19 1/2	@ 85
Manila.....	19 @ 19 1/2	@ 85
Ground, in cs.....	25 @ 2	@ 85
FISH.—		
Sao to Dry Cod.....	5 @ 6	@ 85
do in cases.....	6 @ 7	@ 85
Eastern Cod.....	7 @ 8	@ 85
Salmon, bbls.....	9 00 @ 10 00	@ 85
Ht bbls.....	4 75 @ 5 25	@ 85
2 lb cans.....	3 10 @ 3 20	@ 85
Pid Cod, bbls.....	11 00 @ 12	@ 85
Ht bbls.....	11 00 @ 12	@ 85
Mackerel, No. 1.....	11 50 @ 12 00	@ 85
In Kits.....	3 00 @ 3	@ 85
Ex Mass.....	7 @ 8	@ 85
Pid Herring.....	3 00 @ 3 50	@ 85
Boston Smk'd Hg.....	40 @ 50	@ 85
LIME, Etc.—		
Sta Cruz.....	2 00 @ 2 25	@ 85
Cement, Rosco.....	2 75 @ 3 50	@ 85
Portland.....	4 75 @ 6 50	@ 85
LEATHER.—		
[WHOLESALE.]		
TUESDAY, M., November 27, 1877.		
Sole Leather, heavy, lb.....	26 @ 29	@ 85
Light.....	22 @ 24	@ 85
Jodot, 8 Kil, doz.....	48 00 @ 50 00	@ 85
11 to 13 Kil.....	50 00 @ 50 00	@ 85
14 to 15 Kil.....	50 00 @ 50 00	@ 85
Second Choices, 11 to 16 Kil.....	55 00 @ 60 00	@ 85
Cornellian, 12 to 16 Kil.....	57 00 @ 60 00	@ 85
Females, 12 to 13 Kil.....	63 00 @ 65 00	@ 85
14 to 15 Kil.....	67 00 @ 70 00	@ 85
Simon Ulmo, Females, 12 to 13 Kil.....	58 00 @ 62 00	@ 85
14 to 15 Kil.....	66 00 @ 70 00	@ 85
16 to 17 Kil.....	72 00 @ 74 00	@ 85
20 Kil.....	61 00 @ 65 00	@ 85
24 Kil.....	72 00 @ 74 00	@ 85
Robert Calif, 7 and 9 Kil.....	35 00 @ 40 00	@ 85
Kina, French, lb.....	40 00 @ 60 00	@ 85
Cal do.....	40 00 @ 60 00	@ 85
French Sheep, all colors.....	8 00 @ 15 00	@ 85
Eastern Calf for Backs, lb.....	1 00 @ 1 25	@ 85
Sheep Roams for Topping, all colors, doz.....	9 00 @ 15 00	@ 85
Cal. Russet Sheep Linings.....	1 75 @ 4 50	@ 85
Boot Legs, French Calf, pair.....	4 00 @ 5 00	@ 85
Good French Calf.....	4 00 @ 4 75	@ 85
Best Jodot Calif.....	6 00 @ 6 25	@ 85
Leather, Harness, lb.....	35 @ 38	@ 85
Fair Bridle, doz.....	43 00 @ 72 00	@ 85
Skinning, lb.....	33 @ 37	@ 85
Well, doz.....	30 00 @ 35 00	@ 85
Rub do.....	18 @ 20	@ 85
Wax Side.....	17 @ 18	@ 85

Newspaper Filsholders.

Dewey's new elastic fileholders (black walnut), size of the PRESS, Harper's Weekly and Scientific American, for 50 cents. Larger sizes to suit any newspaper, 75 cents. By mail, postpaid, 10 cents extra. Cash with all orders. Patent allowed. Address, Dewey & Co., Publishers, San Francisco.

To Mining Secretaries.

An amendment to Section 336 of the California Code, taking effect July 1st, 1874, provides that in addition to the regular publication, daily or weekly, of the assessment and sale notices as heretofore,

PERSONAL NOTICE

Must be served as provided in the following quotation from the law:

"The notice must be personally served upon each stockholder, or in lieu of personal service, must be sent through the mail, addressed to each stockholder at his place of residence, if known, and if not known, at the place where he principal office of the Corporation is situated."

The above refers to the ASSESSMENT NOTICE only. Advertisers in the MINING AND SCIENTIFIC PRESS will be furnished with copies of assessment notices printed on slips suitable for serving personal notice under this law at short notice.

DEWEY & CO., Publishers.

Mining and Other Companies.

Persons interested in incorporated shares will do well to recommend this publication of the official notices of their companies in this paper, as the cheapest appropriate medium for the same.

Advance Silver Mining Company.—

Location of principal place of business, San Francisco, California. Location of works, Monitor District, Alpine County, Cal.

Notice is hereby given that at a meeting of the Board of Directors, held on the twenty-first day of November, A. D. 1877, an assessment of fifty (50) cents per share was levied upon the capital stock of the corporation, payable immediately in U. S. gold coin, to the Secretary, at the office of the company, Room 16, No. 309 California Street, San Francisco, Cal.

Any stock upon which this assessment shall remain unpaid on the second day of January, 1878, will be delinquent and advertised for sale at public auction, and unless payment is made before, will be sold on the twenty-sixth day of January, 1878, at 2 P. M., to pay the delinquent assessment, together with costs of advertising and expenses of sale.

B. LINGLEY, Sec'y.

Office, Room 16, No. 309 California St., San Francisco, Cal.

California and Oregon Land Company.—

Location of principal place of business, San Francisco, Cal. Location of works, Jackson County, Oregon.

Notice.—There is delinquent upon the following described stock, on account of assessment No. 1, levied on the seventeenth day of October, 1877, the several amounts set opposite the names of the respective shareholders, as follows:

Name.	No. Certificate.	No. Shares.	Am't.
Allen, J. O., Administrator Estate of	98	600	\$175 00
Belcher, W. C.....	48	500	175 00
Belcher, W. C.....	49	600	175 00
Belcher, W. C.....	60	500	175 00
Clark, J. W., Trustee.....	125	1000	350 00

And in accordance with law, and an order of the Board of Directors, made on the seventh day of October, 1877, so many shares of each parcel of such stock may be necessary, will be sold at public auction, at the office of the company, Room 2, No. 417 California Street, San Francisco, California, on Monday the twenty-fourth day of December, 1877, at the hour of two o'clock P. M., of said day, to pay said delinquent assessment thereon, together with costs of advertising and expenses of sale.

J. W. CLARK, Sec'y.

Excelsior Silver Mining Company.—

Principal place of business, San Francisco, Cal. Location of works, Potosi District, Lincoln County, Nevada.

Notice is hereby given that at a meeting of the Board of Directors, held on the second day of November, 1877, an assessment of ten cents per share was levied upon the capital stock of the corporation, payable immediately in U. S. gold and silver coin, to the Secretary, at the office of the company, 312 Post Street.

Any stock upon which this assessment shall remain unpaid on the third day of December, 1877, will be delinquent, and advertised for sale at public auction, and unless payment is made before, will be sold on the seventh day of December, 1877, to pay the delinquent assessment, together with costs of advertising and expenses of sale.

W. A. KOLLMYER, Sec'y.

Office, 312 Post Street San Francisco, Cal.

Merced Mining and Water Company.—

Location of principal place of business, San Francisco, California. Location of works, Quartzburg Mining District, Mormon Bar, Mariposa County, California.



## Iron and Machine Works.

THOS. PENDERGAST. HENRY S. SMITH

**ÆTNA IRON WORKS,**

MANUFACTURERS OF

**IRON CASTINGS**

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OF ALL KINDS.

mont Street, Bet. Howard and Folsom

**SAN FRANCISCO.**

### SHEET IRON PIPE.

#### Risdon Iron and Locomotive Works

Corner Howard and Beale Streets,

Are prepared to make SHEET IRON AND ASPHALTUM PIPE, of any size and for any pressure, and contract to lay the same where wanted, guaranteeing a perfect working pipe with the least amount of material.

Standard sizes of Railroad Car Wheels, with special patterns for Mining Cars. These small wheels are made of the best Car Wheel Iron, properly chilled, and can be fitted up with the improved axle and box—introduced by this company, and guaranteed to outlast any other wheels made in this State.

All kinds of Machinery made and repaired.

JOSEPH MOORE, Superintendent.

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Manufacturers of all kinds of

Wharf and Bridge Bolts, Railroad Trestle Work, Car Frames and Bolts, Machine Bolts, Set Screws and Tap Bolts, Lag or Coach Screws.

**ALL STYLES OF FANCY HEAD BOLTS.**

HOT AND COLD PRESSED HEXAGONAL AND SQUARE NUTS, WASHERS, BOLT ENDS, TURNBUCKLES, ETC., ETC.

13, 15 & 17 Drumm St., near California,

SAN FRANCISCO, CAL.

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37 Fremont St., cor. Mission, S. F.

**HALL & KELSHAW,**

PRACTICAL BOILER MAKERS,

Marine, Stationary and Portable Boilers, Smoke Stacks, Hydraulic Pipe, Oil or Water Tanks, Ore and Water Buckets, Gasometers, Girders, Bridges and Iron Ship Building.

**ALL KINDS OF SHEET IRON WORK.**

Repairing promptly attended to at the lowest possible terms.

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Manufacture Iron Castings and Machinery of all Kinds at Greatly Reduced Rates.

STEVENSON'S PATENT

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Golden State Pressure Blow rs.

First St., between Howard & Folsom, S. F.

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MANUFACTURERS OF

**STEAM ENGINES, BOILERS AND ALL**

Kinds of Machinery for Mining Purposes.

Flouring Mills, Saw Mills and Quartz Mills Machinery constructed, fitted up and repaired.

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**BIRCH, ARGALL & CO.,**

Builders of QUARTZ, SAW AND FLOUR MILLS.

Keating's Sack Printing Presses,

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Of all sizes—from 2 to 60-Horse power. Also, Quartz Mills, Mining Pumps, Hoisting Machinery, Shafting, Iron Tanks, etc. For sale at the lowest prices by

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210 and 212 Beale Street, bet. Howard and Folsom Sts., - - San Francisco.

Manufacturers of

**IMPROVED PORTABLE**

**Hoisting Engines,**

For Mining and Other Purposes.

Steam Engines and all Kin's of Mill and Mining Machinery

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JONA. KITTREDGE, - - - - PROPRIETOR.

MANUFACTURER OF

Fire and Burglar Proof Safes, Vault Doors, Bank Vaults and Bank Locks, Iron Doors and Shutters, Wrought Iron Girders, Prison Cells, Iron Fence, Guard and Cemetery Railings.

AND ALL KINDS OF

**HOUSE, SMITH AND BRIDGE WORK.**

**FORGING and MACHINE WORK in all its BRANCHES.**

SEND FOR CIRCULAR AND PRICE LIST.

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First and Fremont Streets, between Mission and Howard, San Francisco, Cal.,

**RANKIN, BRAYTON & CO.,**

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ENGINES, BOILERS, MARINE AND STATIONARY. PUMPING, HOISTING AND MINING MACHINERY INCLUDING BATTERIES, AMALGAMATING PANS AND SETTLERS, CONCENTRATORS, ORE FEEDERS, CRUSHING ROLLS AND ROCK BREAKERS, ALSO, WATER JACKET SMELTING FURNACES, FOR REDUCING LEAD, SILVER AND COPPER ORES, QUICKSILVER FURNACES, RETORTS AND CONDENSERS, ROASTING AND CHLORIDIZING FURNACES, SUGAR MILL MACHINERY, WATER WHEELS, ETC., ALL OF THE LATEST AND MOST IMPROVED CONSTRUCTION.

Agents for the Allen Engine Governor, Cook's Boiler Feeder and Heater, Buckminster Rock Drills and Air Compressors heeler's Ore Breaker, Etc.

**GEO. W. FOGG, Supt.**

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Light and Heavy Castings of Every Description Manufactured.

Sole Proprietors and Manufacturers of

**Lynch's Ventilating and Illuminating Tile,**

The Only Illuminating Tile Manufactured for Lighting Cellars, Basements and Dark Rooms which provides proper ventilation for such places

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No. 125 First Street, Opposite Minn

SAN FRANCISCO, CAL.

All kinds Brass, Composition, Zinc, and Babbitt Metal Casting, Brass Ship Work of all kinds, Spikes, Sheathing Nails, Rudder Braces, Hinges, Ship and Steamboat Bells and Gongs of superior tone. All kinds of Cocks and Valves, Hydraulic Pipes and Nozzles, and Hose Couplings and Connections of all sizes and patterns, furnished with dispatch.

J. H. WEED. V. KINGWELL.

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IMPORTERS AND MANUFACTURERS' AGENTS OF

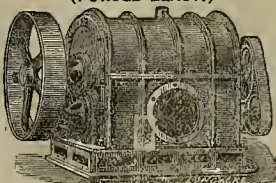
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Mining Engines, Saw Mills, Steam Pumps, Portable and Stationary Engines, Machinists' Tools, Air Compressors and Rock Drills, Wood and Iron Working Machinery, Pressure Blowers, Turbine Water Wheels, Gardner's Governors, Hydraulic Jacks, Leather and Rubber Belting, Emery Grinders and Wheels, Hose, Felt, Packing, Oilers, and Mill and Mining Supplies. Selling Agents in Pacific States for the Roadley Portable, and d'Erville's Vertical and Stationary Engines, and Cook, Rymes & Co.'s Celebrated Hoisting Engines.

Treadwell's Old Stand, Market Street,

Head of Front, San Francisco.

#### BAKER'S ROTARY PRESSURE BLOWER (FORCED BLAST.)

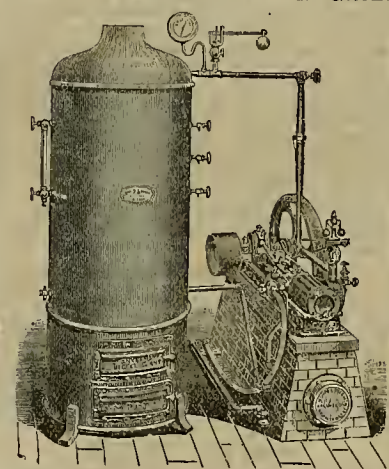


WARRANTED SUPERIOR TO ANY OTHER.

**J. C. Senderling, Sole Ag't Pacific Coast**

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#### SNYDER'S LITTLE GIANT STEAM ENGINE.



For Farmers, Machinists, Printers and all requiring light power. Sizes from one to six horse-power. Prices for engine and boiler complete, from \$150 to \$450. We make the strongest boiler and the best engine in the country. Call at our factory or send for free illustrated and descriptive catalogue.

SNYDER BROS., 94 Fulton Street, N. Y.

#### The Ingersoll Rock Drill



Mines Using these Drills on the Comstock Lode—Virginia City, Nevada.

Con. Virginia M. Co., Best & Belcher M. Co.,  
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O & C Shaft, Bulcher M. Co.,  
Utah M. Co., Yellow Jacket M. Co.,  
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**J. B. REYNOLDS,**

320 Sansome Street.

(Room 10.)

Attention, Mining Companies.

#### RICKARD'S PATENT Oxidizing and Chloridizing FURNACE,

FOR ROASTING

#### COPPER, SILVER & OTHER ORES

Prior to Leaching or Amalgamation.

The most striking advantages which it offers above all other recent inventions of this nature may be briefly summed up as follows:

First.—Its cheapness, the cost of its erection (ex-royalty and freight) not exceeding \$1,500, for a capacity to roast and chloridize twenty tons per day, viz: brick work, \$1,000, and iron work, including blower, \$500.

Second.—Short time required for erection, viz: 14 days, after providing all materials, with a sufficiency of labor.

Third.—No expensive, heavy or complicated machinery being necessary, involving heavy freight to the district where it may be required. Brick and clay generally obtainable on the spot, being the chief materials required in its construction.

Fourth.—No skilled labor or technical experience is necessary to work it. Two ordinary laborers being sufficient to attend to it when in full operation.

Fifth.—It does not easily get out of order, and is readily repaired by an ordinary mason or blacksmith when it does.

Sixth.—The royalty, or license to use it, is exceedingly moderate, removing thereby all temptation to evade or infringe the patent.

Seventh.—Calculating labor at \$3 per day, and wood at \$6 per cord, the cost of roasting is but little over \$1.50 per ton (ex-salt when chloridized), at these high California rates for labor and fuel.

One of them is now in the course of erection by the Aztec Gold and Silver Mining Company, at their mill in the Aztec District, Santa Rita mountains, Southern Arizona. At their office, 302 Montgomery Street, rooms 14 and 15, a model may be seen, and working drawings, with all further information necessary to enable any ordinary mason to construct the furnace, may be obtained from

**COL. J. D. GRAHAM.**

Pamphlets, with illustrations and full description, sent on application.

#### THE O'HARRA CHLORIDIZING FURNACE

Guaranteed to Chloridize from 85 to 95 per cent. of any gold or silver ores that are not more profitable for smelting. Will also desulphurize ores and put them in proper shape for working in cupola furnaces.

**Cost of Roasting and Chloridizing 20 Tons in 24 Hours by this Process:**

One man.....	\$ 4 00
One mail.....	3 00
Wood—23 Cords at \$3 per cord.....	5 25
Salt—1,600 lbs at 24 cents.....	40 00

Cost of 20 tons.....	\$52 25
Cost of one ton.....	2 61 1/2

In a furnace of three or four times this capacity the cost is decreased by 20 per cent.

The furnace is now working successfully at the Poe Consolidated Co.'s mines, in Feavine District, Nev., and at the Exchequer mill, Alpine Co., Cal. For further information, apply to

**D. J. O'HARRA,**

Reno, Nevada.

#### TIRRILL'S UNDERGROUND METRE.

## GAS MACHINES

If you are examining Gas Machines it will be a great mistake not to send for the circular of the simplest and most effective Gas Machine ever invented.

METRE GAS MACHINE, 39 Dey St., N. Y.

### Buy the Best.

Before purchasing an American Watch, examine the different styles manufactured by the **HAMPDEN WATCH COMPANY**, at Springfield, Mass. They are the latest and best improved manufacture. You can depend upon them for fine finish, durability and perfect time. They are sold at favorable prices—in fact, no higher than many of the inferior styles. Examine into the merits of this Watch before you buy any other. Our word for it, you will not regret it.

**DEWEY & JORDAN, Agents,**

433 Montgomery St., S. F.

25 ELEGANT CARDS, no two alike, with name, 10 cents, post paid. **J. B. HUSTED,** Nassau, N. Y.



## GREAT ENTERPRISE!

—THE—

## Sierra Flume &amp; Lumber Co.

Have over 100,000 Acres of

SUGAR PINE, YELLOW PINE, SPRUCE,

Fir and Cedar Lands,

10 Saw Mills, 3 Planing Mills, 1 Sash and Door Factory,

149 Miles V Flume,

10 Miles Tramway,

157 Miles Telegraph Line,

13 Telegraph Stations,

Employ 475 Men and 550 Oxen &amp; Horses.

The Sugar Pine is unsurpassed in quality, and the whole Coast can be supplied.

The Yellow Pine is firm, fine grained and superior to any other hard Pine for Flooring, Stepping, etc. The Spruce has great strength, durable when exposed, and especially adapted to Bridge and Ship Building, while the Fir and Cedar are as valuable for a great variety of purposes.

Last year thirty millions of feet were cut and the estimate for 1877 is fifty millions; fifteen millions are now on hand, thoroughly seasoned by the hot climate of Red Bluff and Chico.

Large orders can be filled on a days' notice for all kinds of

## BUILDING MATERIALS,

Rough or dressed dry, by which elegant and substantial work may be accomplished without delay at the usual cost for green lumber.

Orders for the interior filled at less than San Francisco prices and freights.

DOORS, SASH and BLINDS always on hand in large quantities. Address

## SIERRA FLUME AND LUMBER CO

PRINCIPAL OFFICES:

Red Bluff; Chico; San Francisco—corner Fourth and Channel Sts.

## HIGHLY IMPORTANT.

## GOLD AND SILVER PLATING

AT THE SAN FRANCISCO PLATING WORKS,

653 and 655 Mission Street, San Francisco, Between New Montgomery and Third.

## THREE FIRST PREMIUM MEDALS

Awarded at the last three Fairs of the Mechanics' Institute.

Every description of goods (including table ware) from which the silver is worn, repaired and replated in the best manner.

Watches, jewelry, etc., plated with gold in the finest manner. A large assortment of new styles of Plated Ware and Cutlery on hand and for sale at lowest rates. New and elegant styles of Door Plates and Numbers furnished.

Gold-saving Silver-plated Amalgamating Plates for Miners' use, furnished to order.

EDWARD G. DENNISTON, Proprietor

## Diamond Drill Co.

The undersigned, owners of LESCHOT'S PATENT for DIAMOND POINTED DRILLS, now brought to the highest state of perfection, are prepared to fill orders for the IMPROVED PROSPECTING AND TUNNELING DRILLS, with or without power, at short notice, and at reduced prices. Abundant testimony furnished of the great economy and successful working of numerous machines in operation in the quartz and gravel mines on this coast. Circulars forwarded, and full information given upon application.

A. J. SEVERANCE &amp; CO.

Office, No. 320 Sansome street, Room 10.

## San Francisco Pioneer Screen Works,

J. W. QUICK, MANUFACTURER,



Several first premiums received for Quartz Mill Screens, and Perforated Sheet Metals of every description. I would call special attention to my SLOT CUT and SLOT PUNCHED SCREENS, which are attracting much attention and giving universal satisfaction. This is the only establishment on the coast devoted exclusively to the manufacture of Screens. Mill owners using Battery Screens extensively can contract for large supplies at favorable rates. Orders solicited and promptly attended to.

32 Fremont Street, San Francisco

A 16 Candle Light for One Thousand Hours at a Cost of 30 Cents.

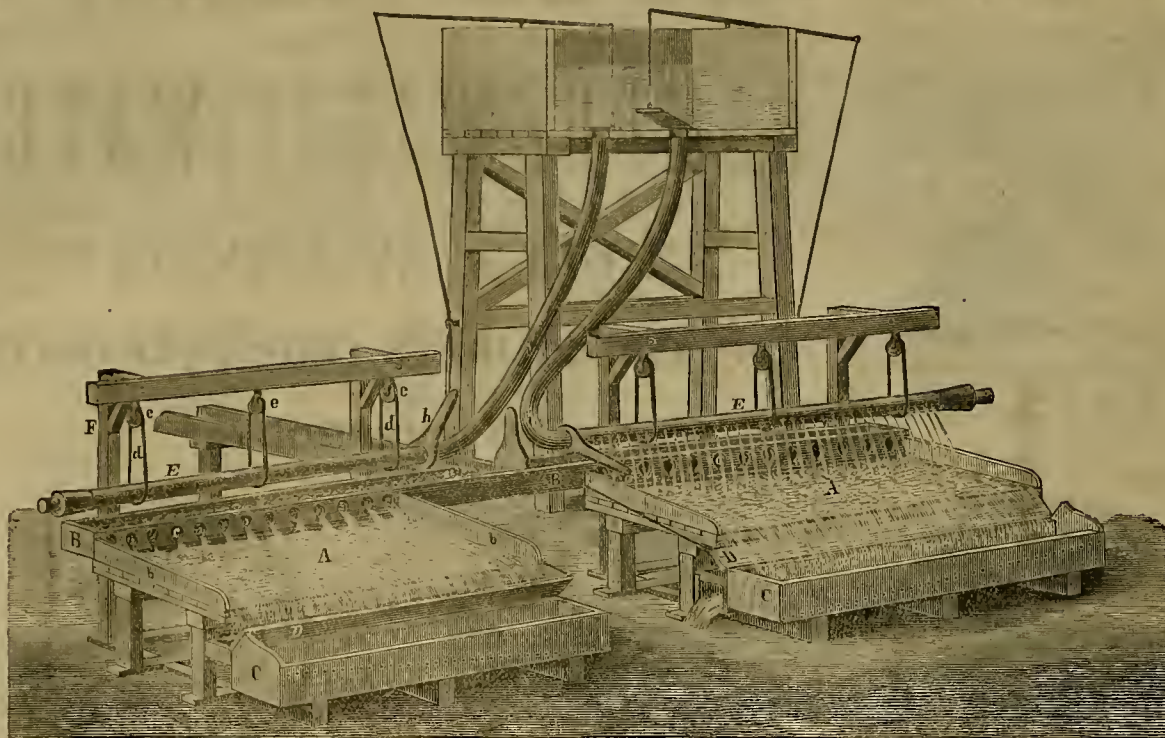
## WREN'S PETROLEUM GAS WORKS

Are now doing this in Towns, Cities, Mills, Hotels, etc., where in use. The same amount of light from coal gas, at \$3 per 1,000 feet, will cost \$15.

Send for references.

W. C. WREN, Cor. Jay &amp; Water Sts., BROOKLYN, NEW YORK.

## TOLLES' IMPROVED CONCENTRATING TABLES.



Improved Concentrating Tables.

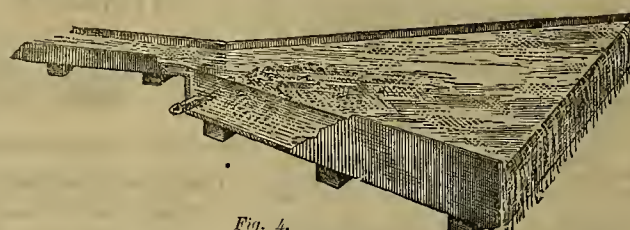
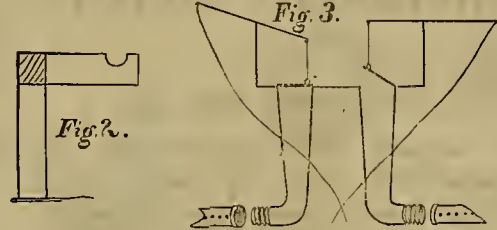
The illustration on this page represents an improvement in concentrating tables for ores, recently patented through the MINING AND SCIENTIFIC PRESS Patent Agency, by J. U. Tolles, of Virginia City, Nevada who has been using the apparatus very successfully in several places. In the engraving, A represents a flat inclined table provided with a surfacing of cloth or other suitable material of any kind, and with the ledges B, to prevent the material from passing over the ends. B represents a peculiarly constructed feed box extending along the upper edge of the table and provided in its front side with a row of discharge openings C, of the form shown, each narrowing down to its lower end and of such a size as the nature of the material requires. C represents a receiving box or trough, extending along below the lower edge of the table. D represents a leaf or board hinged to the rear side of the trough or box C, in such a manner that it may be

leaf D, is drawn (by the rod) under the edge of the table, the pipe being rotated or turned and the water thrown through the perforations upon the table in a row of fine jets, forming an almost continuous sheet or film. By means of the lever E, (which should be fastened on the pipe at right angles to the line of perforations), the tube is turned and the sheet of water swept over the table from the top to the bottom so as to drive all adhering particles therefrom and wash them down into the box C. After this operation the jets are stopped from the tube, the leaf drawn back, and the gate shipped to the other feed box, the feed water coming back on the first table, the operation being repeated as often as it is seen the tables are charged with the sulphurets or other valuable metals.

By employing the proper kind of cloth and giving the tables the proper grade, and properly regulating the flow of water the inventor finds that he can effect a very rapid and thorough separation without agitating the table, and without power of any kind except the manual labor requisite to change the feed from one table to another, and

kind of sizing apparatus in connection with the tables, the inventor is doing some close work with them at a nominal expense of constructing, running and keeping in order. He states that any person using anything of like nature, or any portion of the same for like purposes, without first obtaining license for so doing, will be prosecuted for damages for such use. Persons at a distance can build and run them by first obtaining license and instructions from the inventor, John U. Tolles.

**Additional Improvement.**—The operation of this improvement is as follows: The tailings are conveyed into the narrow end of the tanks, all of the coarser sands falling immediately below the current, the lighter being carried forward and deposited in its proper order, which causes a gradual sizing or separating from the coarser sands down to the very finest of the slimes; the latter being always the richest, and where the loss has heretofore been in all concentrating machines, as it is impossible to give current or motion to any machine that will keep the coarser sands free, without all of the slimes passing away



turned under the edge of the table to conduct the valuable material therefrom into the box, the refuse passing over the edge of the table and discharged upon the ground, or into the box in the rear of the box C. E represents a rotating tube or pipe suspended lengthwise above the upper edge of the table by endless belts D, passing over pulleys E, supported in the rigid frame F, or by brackets fastened to the frame and extending over the proper distance over the table, the tube resting and rotating upon them as shown in Fig. 2. The tube is provided from end to end with a row of perforations, and with a hand lever H, at one end, and is connected by a hose I, to a tank, pump or reservoir, delivering water at a pressure of from eight to 12 feet of head, as the nature of the case requires.

In operating the machine the feed box is narrowed to about one inch at its farther end, or has a strip of board set edgewise in the bottom and running obliquely across the same from the rear to the front side, causing the material to gradually be brought to the front and discharged through the feed holes C, upon the table, thereby insuring an even distribution and steady flow of the material to be treated; a steady and copious supply of water is maintained in the box, and the ores, sands or tailings introduced therein. The water escaping through the openings C, flows down in a thin light stream over the face of the table. The mineral particles are deposited upon and retained by cloth or other surfacing material on the face or bed of the table, while the light refuse matter is carried over the lower edge and discharged outside of the box C. After the collection of a suitable amount of metal upon the table, the supply of water, etc., to the feed box is stopped by the gate and turned upon the other table. Clear water is now supplied to the first pipe E, and allowed to run down over the table, (for a moment), washing off the remaining refuse sands, and at the proper time the hinged

washing them off by means of the water used in the pipes; he also finds by the employment of the fixed table he can separate particles which cannot be retained in machines which vibrate. By use of the feed openings C, of the form shown, the discharge of the sand, ore or other fine material is rendered very steady and gradual, as it will be carried through the narrower portion of the openings, while the lighter water will pass over the sand through the upper large end of the openings, taking up the material very gradually and distributing it very evenly upon the table. It is obvious that the rotating tube may be sustained in any other manner, and that it may be connected in any suitable manner with the source of the water.

The object in arranging the perforated pipe so that it can rotate is to permit a gradual change in the direction of the jets, so that their point of impact upon the table can be advanced from its upper to its lower edge, and thereby every portion of the surface subjected in turn to the direct impact of the jets, in order to effectually loosen and drive forward the particles therefrom.

The flow of water can be regulated by the valves operated by the cords. The gate shown in the feed trough G, will throw the water into either feed trough as desired. The plugs in the ends of the pipes E, are for the purpose of freeing them of any obstructions.

Fig. 3 represents the most convenient form of erecting the tank or reservoir which supplies the tubes with water, it usually being placed directly overhead with water shed underneath.

Mr. Tolles with this apparatus does not profess to do what many others claim to do, but he is running many of them where everything else has failed. He has been running several of these tables on the Comstock for nearly two years and is now building more. By using the proper

and being lost. This very effective, cheap and simple improvement completely overcomes this difficulty.

There are two of the tanks, so that one is filling as the other is being washed out, the latter operation being performed by a hose, the flow of water being regulated according to the grade of the material; commencing at the narrow end and using the full amount of water required to keep the tables clear, and gradually reducing the water as the slimes are approached in the wider end.

The perforated pipe at the narrow end is for the purpose of using a small amount of clear water under a light pressure, making an undercurrent to keep any slimes from settling with the sands. It is also used in washing out the tanks by letting on a full head of water, and having the holes so as to direct the water into the wider part of the tank, the water supply being all managed by cords leading to where the person stands in operating the machines.

The average size of the machines on the Comstock is from 30 to 50 feet long, by from 9 to 12 feet wide, and cost from \$125 to \$250 each. Those that the California and Consolidated Virginia companies have used for the last three years, cost about \$500 for the pair, are working about 700 tons of tailings in 24 hours, and getting from seven and a half to ten tons of concentrations per day, or about \$6,000 worth per month, only requiring the labor of one man, and the total expenses not being more than 50 cents per day of 24 hours (or 75 cents including the royalty).

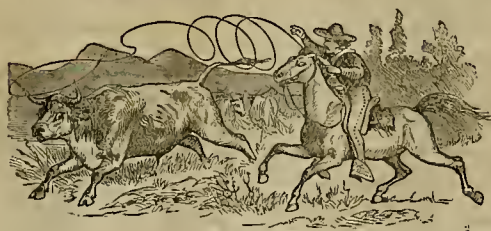
The tables are working at the tail end of 12 strings of blanket sluices which are 1,200 feet long each. The price for the right to build and use the machines is from \$200 to \$500 per pair. Address

J. U. TOLLES, 824 and 826 Kearny Street, San Francisco, California, and full instructions will be given in detail.

## OAK-TANNED

## LEATHER BELTING.

COMBINATION  
—OF—  
FILLED  
RAWHIDE  
LEATHER  
BELTING.



TRADE MARK

RAWHIDE BELTS,  
Rope and Lacing.

H. ROYER, 855 to 861 Bryant Street, San Francisco.

## STEEL CASTINGS,

Solid and Homogeneous. An invaluable substitute for expensive forgings, or for Cast Iron requiring great strength. Send for circular and price-list to

CHESTER STEEL CASTINGS CO.,

EVELINA STREET, - - - PHILADELPHIA, PA

## MINING INTEREST FOR SALE.

For a small amount, in several claims on one of the

## RICHEST LEDGES IN ARIZONA.

Money needed for development. The ore will pay a handsome margin to ship to the city. Apply at this office.

50 LARGE MIXED CARDS, with name, 13c, 40 in case 13c. 25 styles Acquaintance Cards 10c. Agents DOWD & CO., Bristol, Conn.



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THE

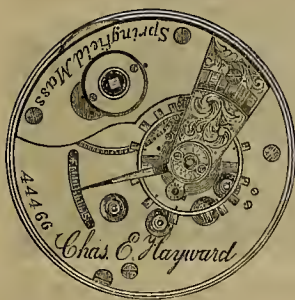
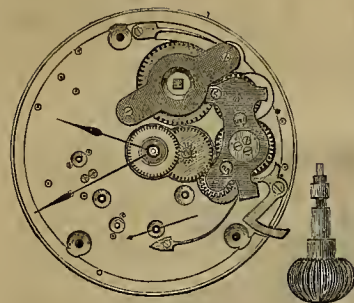
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# MINING AND SCIENTIFIC PRESS.

An Illustrated Journal of Mining, Popular Science and General News.

BY DEWEY & CO.,  
Patent Solicitors.

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VOLUME XXXV.  
Number 23.

## The "Devil Beans" of Mexico.

How Related to the Work of Gall Insects.

[Written for the Press by J. W. A. Wright.]

Among the many odd forms of insect life, none are more curious than the gall insects. Like all winged insects, they pass through the four stages of (1) the egg, (2) the larva or maggot, or grub, or worm, (3) the pupa, or cocoon, or chrysalis, (4) the perfect or winged state.

What especially distinguishes them from other insects is that, in the larva or worm state, they are found enclosed in cells of very varied forms and colors, which grow abnormally on different kinds of plants—including trees, shrubs and herbs. Oaks, hickories, cottonwoods, willows, sumacs, azaleas, rose-bushes, the golden rod and other herbs, and even grasses, abound with them. An odd feature marking all of them, and illustrating the great maxim—"like causes produce like effects"—is that in some way the galls containing the larva partake unmistakably of the nature of the plant on which they grow.

These cells or galls—the homes of the various larva—grow in the spring or summer as excrescences, because of the irritation produced either by the eggs deposited under the bark by the mother-insect, or by the young grub, boring into the plant in search of its needed food and protection, guided by the promptings of instinct.

The perfect or winged insects which deposit these eggs that are in turn to pass through the larva and chrysalis state into insects like themselves, in due course of nature, are quite varied in form, and belong to five of the seven groups or orders into which the true insects are now divided. Some of them are: 1. Clear-winged flies (*hymenoptera*), shaped like wasps and bees. Members of this group form our common oak balls, and the nutgalls of Asia Minor, such a necessary ingredient in making ink, and the celebrated Dead Sea apples, or apples of Sodom, found on the scrub oaks of southern Syria; also the pretty colored rose-galls, covered with prickles, and the noted joint worm, which often seriously damages our growing wheat, rye and barley. 2. Two-winged flies (*diptera*), shaped like mosquitoes, gnats and house flies. They form galls on willows like pine cones; apple galls and filbert galls, on grape vines; trumpet galls on grape leaves, and tube galls on dogwood leaves. The Hessian fly, so destructive to grain, is among these. 3. Bugs proper (*hemiptera*), like plant lice. Some of this group make the green, shining galls, and the rose-colored swellings on cottonwood trees, and the hollow, reddish galls on sumac leaves. This class includes the *phylloxera*, both the species which forms at least 16 different kinds of galls on hickory trees alone, and that notorious and dreaded species which has played such havoc in the vineyards of France and so alarmed the vine growers of California for a year or two past. 4. Beetles (*coleoptera*), consisting of a kind of weevil, which by its punctures and deposit of eggs causes swellings in grapevines and raspberry stems. 5. Scaly-wing insects (*lepidoptera*) or moths. There are fewer species of this group than in either of the first four mentioned. Their larva form swellings in the stems of the golden-rod, false indigo and perhaps other herbaceous plants.

Then besides these five groups, there are gall mites (*acarina*) which belong to the spider family, as they have generally eight legs, rather than to true insects which have but six legs. Yet they come pretty near the dividing line of true insects, as some of them have six legs. These little mites form purse-like galls on leaves of the wild plum and wild cherry.

This epitome of established facts in the interesting study of entomology or "bug-ology," whichever your readers choose to call it, is given for the better understanding of the accompanying description and engravings of the so-called

### Devil Beans.

Or jumping beans, found in western Mexico among the mountains a hundred miles or so inland from Mazatlan, Acapulco, and other coast towns, and frequently brought to San Francisco as curiosities by the Panama steamers.

Before fuller description, and for the better understanding of your readers, let me recall the description and engraving of the queer little "flea seed" given in both the *SCIENTIFIC* and *RURAL PRESS* of February 14th, 1874. No doubt many of your readers keep files of your instructive papers—as it would well repay all to do. But, for the benefit of those who do not, the engravings are here reproduced, that the difference between the "flea seed" of California and the "jumping beans" of Mexico may be more clearly seen.

As shown by Mr. Kinne, these minute galls, about the size of mustard or alfalfa seed, are found by the puncture and deposit of eggs on the underside of leaves of the California white oak by the insect here represented, *Cynips saltatorius*—engraving 20 times the natural size. As will be at once seen, this insect belongs to the first group above described.

The odd quality of their small seed-like galls is that they hop or bound about at a wonderful rate when warmed by the sun, or hand, or artificial heat; such motion being caused by the contraction, sudden straightening, and concussion against the sides of its shell, by the minute larva or worm inclosed in each, its antics being not unlike those of a "skipper."

We are now ready for the description of the curious jumping beans, with the insect which causes their odd movements, and the very accurate engraving in seven figures of natural size—prepared by your artists from nature espe-



Cynips Saltatorius and Its Flea Seed.

cially for your columns, and the first, perhaps, ever made.

For the beans used by the draughtsman and engraver, we are indebted to Mr. W. H. Richards and Mr. H. D. Pearce, of San Francisco. The engravings of the perfect insect, or moth, which is the original cause of the motions, and its chrysalis shell, are made from a specimen hatched out at the gold pen maker's shop of the latter gentleman on the corner of Montgomery and Merchant streets, where samples of the beans may be seen.

Fig. 1 represents the three so-called beans as they grow together on a small bush in the Mexican mountains, which is said to be somewhat like our hazel bush in size. Unfortunately, no one here, so far as we know, has been able to get specimens of the bush, so that it may be identified; but steps have been taken by which we may hope to obtain it. Hence, its exact nature botanically is not known, but because of the form of this supposed seed-pod, it has been conjectured that it belongs to the order *Euphorbiaceae*, which includes the spurge, palmar-christi, cassava, the box-tree (*buxus*), the Queen's delight (*stillingia*), caoutchouc-plant (*siphonia*), and the crotons, both the species producing the noted irritating oil, and that from which casca-rilla bark is obtained.

Fig. 2 shows how the three exactly similar parts or pods separate, while Fig. 3 is the single bean in the form in which it is usually seen, when placed on one end. It generally rests, however, on its round surface, or on one of the two flat faces, where the beans were joined. The white spot in Fig. 3 is a thin film, like the eye of a bean. If it is removed by the point of a knife, a thin white web is spun over the opening in a short time by the little yellowish maggot or larva, Fig. 4, which is very much like the worm frequently found in chestnuts. This

is the little occupant that gives, by his jerks and thumps against the sides of his home, the jumping power in which the truly wonderful feature of these beans consists. Each bean is very light, averaging in weight about two grains, and hence is easily moved by the larva. Place one or more of these beans in your hand, or near a warm stove, or under the rays of the sun or a gas jet, and though perfectly quiet before, and an entirely inanimate looking object, it will soon begin to turn from side to side; perhaps, with a sudden jump, turn completely over or stand on one end, and often, by its successive jumps, moving quite a distance. After watching the motions of this apparent seed-pod, very much like a fresh grain of coffee in color and shape, only larger and thicker, and with no semblance to any living form, you do not wonder at the name "devil-bean," given to it by our Mexican neighbors, who are prone to ascribe everything queer in nature, which they cannot understand, to the agency of his Satanic Majesty.

Keep one of these greenish, coffee-like beans in a moderately warm place, and, before a great while, the larva will have gone through its allotted changes; the perfect insect, a moth or fly, little more than three-eighths of an inch long, with light-brown, satiny wings, of uniform color and brown, hairy body, without any stripes or spots; will cut out at one end of his shell a small round piece, as nicely as if with a tiny saw, and crawls out enveloped in his chrysalis skin or sack, Fig. 5, which he soon leaves



Devil Beans and Insect.

near the empty pod which has so long been his home. Its appearance then, in a somewhat dormant state, is very accurately shown in Fig. 6. An excellent likeness of this moth is given, with wings extended, in Fig. 7—perhaps a very little larger than its natural size.

Now, as regards the relationship of the work of this moth to that of gall-insects. As is seen above, there are moths among the gall-insects. It has been conjectured, that the insect whose larva is found in the "jumping beans" is a gall-moth. Really we have not as yet sufficient data to decide with perfect certainty whether it is or not. To be a gall insect, the whole pod in which the insect is found would have to be caused by the juncture and deposit of the egg.

The strong probability is, however, that the so-called "beans" are the seed pod of some plant, and that the moth deposits its egg in the pod when very young—possibly even when in the flower state, as the troublesome apple moth deposits its egg in the apple flower. If so, the larva destroys the germ and cotyledons of the seed totally, leaving the mere shell. The reasons in favor of this view are: 1. The great regularity in form of the three united "beans." 2. There being no perceptible mark on the thin hull of the "beans" of any puncture of an ovipositor.

These and similar points are yet open to investigations, which are being made. It is a pleasure to state that Mr. Harry Edwards, so well known in connection with the California theater, and one of the best posted naturalists of this coast, is thoroughly investigating the matter, being in correspondence with the manager of the British Museum, London, and will soon give us a report, which will be looked for with much interest.

The devil-bean moth clearly belongs to the

group of *Lepidoptera*, or *scaly-wing insects*. Mr. Edwards thinks it is certainly among the *Tortricidae*, or family of leaf-rollers. Several of this family, like the apple worm, or codling moth (*Carpocapsa pomonella*), described in the *RURAL* of October 27th, instead of rolling their eggs and larva in leaves, deposit them in the young fruit of the plants to which they are partial, and are hence called bud-moths. Mr. Edwards thinks it quite likely this moth is a new species. On this and other interesting points he hopes soon to give us more definite information than is at present possessed.

December 3d, 1877.

## Quicksilver in Southern Oregon.

We learn from J. M. Sutton, an old Oregon pioneer, that quicksilver is being developed in the Rogue River valley, Jackson county. The first shipment of metal, consisting of 50 flasks, was made to this city last week, and was sold at 44½ cents for shipment to China. Mr. Sutton brought us an item concerning the mine from the *Ashland Tidings*, which we append, premising, however, that cinnabar ore which works 57% is rather rare, and they must not expect to find very much of that class of ore. Three or four per cent. ore is pretty good, and some considerably lower than that has been worked at a profit. The item referred to is as follows:

The Emeline mine is situated on the south slope of the Siskiyou, about four miles south of the State line, and consequently is in Siskiyou county, Cal. It is on a branch of Beaver creek, an affluent of the Klamath, and is about 35 miles from Jacksonville and perhaps 25 from Yreka. About 16 miles from Jacksonville the wagon road terminates, and only a horse trail extends from that point to the mines. The route is not a rough one, however, and a good wagon road could be made the entire distance at a moderate expense. The regular daily yield of this mine, with the retort now in use, is about 200 pounds. The ore is immensely rich, having yielded since operations began, although the process of retorting has been quite imperfect, 57% of pure quicksilver. This is better, we are informed, than the average yield of the New Almaden mine, in California. A single piece of ore, weighing 11 pounds, yielded 9½ pounds of pure quicksilver, and the probabilities are that there vast quantities of ore in the lead quite as rich. The mine seems of immense extent, and there is no estimating its value.

## Copp's Mining Laws.

Henry N. Copp's hand book of mining laws, just issued, contains the United States mining laws and instructions thereunder, a digest of decisions, forms, list of mining patents issued, etc. The digest of decisions alone is a very valuable thing, giving, as it does, in brief form, all the decisions of the Secretary of the Interior and Commissioner of the General Land Office in relation to mining matters. These are all under proper headings for easy reference. Forms are given for notice of location, proof of labor, notice of forfeiture, miners' lien, application for survey, patent, etc., affidavit of improvements, etc. There is also a list of patents issued for mining claims from July 26th, 1866, to August 1st, 1877. The book is of pocket size and very convenient for all who are interested in mines. It will be sent postpaid for \$1, on application to Dewey & Co., 202 Sansome street.

ANOTHER TELEPHONE.—The telephone is being rapidly introduced for practical use. H. Royer, manufacturer of helting, has, for the convenience of customers, made a connection by telephone between his belting factory, 825 and 861 Bryant street, to the salesroom of the Pacific Saw Manufacturing Company, 17 and 19 Fremont street. By this simple means anybody may send a message or communicate directly with the factory without trouble.

It is estimated that the total yield of the Yellow Jacket mine, on the Comstock, from 1864 to the present time, has been \$14,372,172.



## CORRESPONDENCE.

It is the desire of the editors of this journal to be liberal toward all correspondents, and therefore statements and opinions are frequently published, on the authority of the writers, for which we do not assume responsibility.

### A Trip to Lake County.

EDITORS PRESS:—Some time during the month of August last the writer, in company with a friend, made a flying visit to the sulphur banks in Lake county, and I send notes of what we saw on the way. Though late in the day, it may be of interest to some of the readers of the PRESS. The route chosen was via Pope valley, Butt's canyon and Long valley in Lake county. The first seven miles from St. Helena is up an easy grade to the summit of the Howell mountain. After crossing a low divide some two miles from St. Helena, we have the beautiful little Conn valley spread out suddenly at our feet. It is about eight miles long, very narrow but affords a delightful landscape with its grain fields, vineyards and pasture lands.

Where the road sweeps around the head of this valley, and at an elevation of 1,400 feet above tide water, is the residence of

Mr. Toland.

A nephew of Dr. Toland of your city. Mr. Toland came here some six years ago an invalid, given up to die, with that dreadful scourge of civilization, consumption. Being so far above the fogs and damps of the valley below, and in an air so clear and bracing, he was enabled to recuperate and enjoy comparative good health ever since; and with fair prospect of living many years yet among his fellow men of earth. Many afflicted ones visit this Alpine region every season during the summer months, some camping several weeks together, and all are benefited, especially those afflicted with asthma.

At the summit of the Howell mountain, some 200 or 300 feet above Mr. Toland's place, we found ourselves on a broad plateau of rolling country, heavily timbered with black oak and pine. Five thousand two hundred acres of this land is covered by a grant, which is now owned by the Napa Bank, except 200 acres containing all the improvements, which was sold to Mr. Anguin for \$9,000.

As much of this land is in the thermal zone or warm belt, where frost is seldom known, it is thought to be a favored locality for fruit raising, and acting upon this idea, the writer has since purchased a home on this mountain at an elevation of 1,500 or 1,600 feet above the sea, overlooking a portion of Napa valley, with St. Helena as a background just six miles distant.

Pope Valley,

On the north side of Howell mountain, is probably 15 miles long by from two to five wide. It contains many fine grain farms and sheep ranges. A narrow-gauge railroad from Napa City through this valley and Berryessa to Lake county, is now being agitated, and if put through, will be an impetus to trade in this direction.

The Phoenix quicksilver mine is located on the western rim of the valley. As it was not in operation at the time, we did not visit it; they having shut down for repairs.

A Mineral Spring

Has been discovered in the neighborhood of the mine, which is highly recommended by a Napa physician for bilious and rheumatic patients who may bathe in its waters. On learning that the first effect was to "rile" the stomach, we decided we were not much sick, so passed on to the first nice shade and there discussed the contents of a well-filled lunch basket which this "gude" wife had thoughtfully prepared for us. We left the valley by entering a narrow defile known as

Butts Canyon.

We had a lonely ride of some 10 miles under a midday sun, whose heat intensified to a tropical degree by the reflection from the steep mountain sides, which were treeless, rock-ribbed and desolate in this extreme. There was nothing to disturb the profound silence but the rustling sound of the lizard, as he slid over the hot rocks at our approach. The road was a good one, newly made, with no steep grades, but rather narrow for wagons to pass. This will be the principal outlet for the products of eastern Lake county until a railroad is built. There is neither mountain to cross nor toll to pay. The route is through Butts canyon, Pope valley and Childs canyon to Rutherford, in Napa valley, a distance of about 30 miles from Middletown, Lake county.

Guenoc

Is situated on the western confines of the valley, on the banks of Putah creek. Its prestige is gone. Middletown, its rival, four miles distant, has conquered. The last institution to go down was a "whisky mill," which struggled hard for an existence, but had at last to succumb to the inevitable.

Lower Lake

Is 12 miles distant from Guenoc, over a broken country, with little arable land until, within three miles of town, a small valley opens to view, which contains several fine farms. The

hill country is blessed with an abundance of oak and fir timber, and the higher mountains with immense forests of pine. Many saw mills are located in these forests, and are doing a thriving business in supplying the local market with lumber. Lower Lake is situated at the foot of some gently rolling hills, about one mile from the lake, which is not visible except by climbing the elevation in the rear of the town. The town has a good flouring mill, a brewery, a printing office, and several stores. A fine brick school house was erected about a year ago. An incendiary burned it down, but Phoenix-like it rose from its ashes, and now stands an ornament, and the pride of the citizens. The Lower Lake Bulletin is published here, a wide-awake journal, devoted to the interests of the people.

Borax Lake.

Nine miles from Lower lake, is about three-fourths of a mile long by one-half mile wide. It was lower this season than for many years, and the odors from its waters savored strongly of soap suds. Having heard its detestable qualities highly spoken of, we thought we would take a bath in its waters, but one examination found it contained myriads of living animalcules. My friend waded out some distance, but repented his rashness, for it produced a burning sensation of the skin for several hours. Extensive works were at one time in operation here, but the buildings are going to decay or tumbling down; and the scows that were once used for carrying the mud to the shore when dredged from the bottom of the lake are lying high and dry on its banks. After procuring some crystals of pure borax from the dried mud at hand, we proceeded on our journey, and on reaching the top of the hill near by, we had a fine view of

Clear Lake.

This lake is said to be 30 miles long and 15 wide at one point. We had an uninterrupted view over its beautiful clear waters for some 20 miles in the direction of Lakeport the county seat. Uncle Sam mountain looms up conspicuously on the opposite side of the lake from where we stood. At the foot of the hill and on the lake shore are the celebrated "Sulphur Banks" which has proved to be the richest in quicksilver of any mine on the coast, or perhaps in the world. The Supt., Mr. Tucker being absent, we could only learn these facts. In the month of July 1,056 flasks of quicksilver were produced, weighing each about 85 pounds. The force employed was 165 Chinamen and 35 white men. Three years of constant work has made but little impression upon this great "Bonanza" mine, and millions are yet in sight. The deadly gasses from the works have killed many acres of timber in the vicinity. In the mine is a large cauldron of boiling seething water caused by the sulphurous gasses making their escape through it.

There is a hotel and store kept here. Two little steamers touched in while we were there; the *Emma* and *City of Lakeport*, the latter connecting with a line of stages running from Calistoga to Lower lake. The passengers were allowed half an hour to visit the mine and works, when she blew her whistle and sped on her way to her destination, Lakeport.

On our return we were amused at the antics of that rare bird the "Road Runner." It was in a pasture not far from the road chasing grasshoppers. It would straighten out its long tail and neck and go with the speed of the wind for his intended victim and seemed unconcerned at our near presence.

Middletown.

In the Loconoma valley, has several stores, a good hotel, the Lake House, and several boarding houses and a restaurant; also a good livery stable and one or two churches. There are organized societies of Methodists, Presbyterians and Seventh-day Adventists. The village is built upon a dry gravelly plain, but its wells afford the best and coldest water in this part of the State. There are many good farms near the foothills that provide fair crops of hay and grain—a good market for which is found among the many stage companies and pleasure resorts in the neighborhood. Harbin springs is at the head of a beautiful little glen two miles from the town. Anderson's springs is five miles; both of them do a thriving business in the summer season.

Cobb valley, on the top of Cobb mountain, is 1,000 feet or more above the Loconoma. There is a good hotel kept in this valley at a place known as Glenbrook, for the benefit of visitors. We noticed a few apple trees in the valley that showed the same thrift, and healthy appearance as those of Mr. Anguin on Howell mountain.

From Middletown to Calistoga is 16 miles. Our route was over a good toll road through a long canyon, on the banks of a pearly stream, fringed with alders, laurels and arbovitae with a dense undergrowth, among which we observed the shrub honeysuckle. At the toll gate, which is at the summit of the divide between the waters of Lake and Napa counties, we halted and prepared for the ascent of

Mt. St. Helena.

Our route was by the Calistoga silver mine, which has not been worked for the last two years, for reasons best known to its owners. Alas, for the town of Silverado; when the mine shut down its glory soon departed, and it is so effectually dead that there is not a soul left to give its history. We followed a well beaten trail to the summit which is nearly 5,000 feet above the sea, and had spread out before us a panorama of surpassing beauty. You take in all of Napa valley at one view, with Mt. Diablo and the hills beyond an Francisco as a back-

ground. You have a good view of the valleys from Petaluma to Healdsburg in Russian River valley, with a glimpse of the ocean beyond. Knight's valley is at your feet, with the Yellow Jacket and Ida Clayton quicksilver mines at the base of the mountain. Turning to the northward and you see Middletown and the adjacent valleys in Lake county. The Great Western quicksilver mine is on the north side, right under the shadow of Mt. St. Helena.

Turning more to the eastward and you have a peep into the northern rim of Pops and Berryessa valleys, with a glimpse at the snow-capped Sierras. This completes the view that you obtain of six different counties, by simply turning once around. The mountain has two summits half a mile apart, with a deep round valley between, with an opening on the southwest side that drains it. It is probably an extinct crater, as the mountain is said by geologists to be of volcanic origin. In viewing the summit of the mountain as you pass through Knight's valley, you have only to stretch the imagination a very little, to see the outline of a female in a reclining position. And for this reason, we are informed, the Spanish travelers named it after Helen, the mother of Constantine. There is a good hotel at the toll gate to accommodate those that may wish to pay this grand old sentinel a visit, and I would advise tourists not to pass it by. We returned home by way of Calistoga and down our own beautiful Napa valley much refreshed and benefited in health from our trip to Lake county.

JOHN MAVITY.

Mountain View, Napa Co., Nov. 20th, 1877.

### Trees and Rainfall.

No 3

[Written for the PRESS by SAMUEL PURNELL.]

#### Influence of Trees on Climate.

In considering the influence of trees upon the climate and rainfall of the Pacific coast, we first encounter the impossibility of finding any records of the climate and rainfall of ancient times. Beyond the mere fragments handed down by the early Spanish discoverers, the records do not extend beyond a quarter of a century, a time too short to be of value in determining a change of climate.

Looking first at Arizona, we see extensive ruins of aqueducts and cities, showing the former presence of a large agricultural population. That Arizona, and, indeed, the whole Pacific coast, has been peopled by one race or another from remote antiquity does not admit of doubt. Some portions, as central Arizona, were densely settled. Western Arizona is now, for the most part, a sandy desert, destitute of trees, with but a few inches of rain during the year, and burned by a blazing sun. By what means, then, did Arizona once sustain her large population, and why is the country now a desert? Arizona had once an abundance of rain, and that within the general historical era and the present geological epoch. Now the rains have ceased, and these are the reasons why:

The moisture that now falls in scanty summer showers upon Arizona comes from the same monsoon that blows up the Mississippi valley; it crosses Texas and New Mexico, losing most of its moisture in passing over high mountains, and by the time it reaches Arizona its humidity is so greatly lessened that very little of its remaining moisture can be condensed, and the surface of Arizona does not offer the necessary conditions for condensation. When the rain fell in ancient times the surface of the territory was covered with forests; the air and earth were cool, and the moisture of the warm rain clouds was easily cooled and precipitated. But the ancient people, through ignorance, through selfishness, through domestic use, and through wars, slowly destroyed their forests. The results were most disastrous to them. Soon the summer rains ceased to descend, the hot and bare earth increased the dryness of the air. Only the winter rains then fell. To raise crops the people were forced to resort to irrigation, and the remains of great reservoirs and canals attest their struggle for existence. More trees were destroyed, and less rain fell in winter, and soon not enough to fill the reservoirs against the summer droughts. Then began the extermination of the inhabitants; no fruits or grains matured, the blazing sun parched the ground, and the sands of the desert slowly crept over the once smiling valleys. Most of the people starved, a few fled to foreign lands, and the remainder managed to subsist upon the mountains till exterminated by the Indians. The spoliation of the forests, the robbery of that part of nature which alone can make a country fertile and inhabitable, was the cause of their destruction, and not the Indians. Nature, just and kind and beneficent when understood and obeyed, permits no infractions of her laws, but drives from their country, or sweeps out of existence as unworthy of her continued favors, nations who commit the unpardonable sin of destroying her living forests.

#### The Rainfall Question in California.

California is at present most unfortunately situated in regard to rain. A large part of the State is uninhabitable, being nothing less than a hot, sandy and almost rainless desert. Except a narrow strip of coast, most of southern California is an uninhabitable desert, possessing indeed a few oases, like Los Angeles and San Bernardino, but in general it is given over to

desolation. The Colorado and Mohave deserts are as barren, as sandy and as completely solitary wastes as the great desert of Sahara, being inferior to the latter only in extent. In central California, while we do not find sandy deserts, we yet see vast tracts of mountain and valley lands upon which no human being lives, upon which nothing grows in summer for want of rain. It is the purpose of these papers to explain the causes of the want of summer rains and the consequent barrenness of most of the State, and to show how California may secure rain every month in this year, become wonderfully prolific and be inhabited to this mountain tops by a well fed and happy people.

### A General Sketch of Colusa County.

EDITORS PRESS:—Your request to be furnished with a few facts concerning Colusa county for publication, was received too late for many interesting details, as unfortunately no notes were taken by the way. A general view or such as can be given from memory must therefore suffice:

This county embraces a broad field of territory and in proportion to its extent, more than the usual amount of tillable land. A very large area of summer-fallow has already been put in, and everywhere for miles and miles, as far as the eye can reach, both hills and plains "stand dressed in living green" of grass or grain. The promise at present of an abundant crop could not be better. This chief product is wheat, with a strong re-inforcement of barley.

Colusa county is, perhaps, most celebrated for its large grain ranches. It is a small farm here if it contains less than 300 acres. A great many embrace from 400 to 1,000. A few more from 1,000 to 20,000, and one, at least (Dr. Glenn's), is said to cover about 60,000 acres, and believed to be the largest grain ranch in the world. For convenience of description, the populated part of this county may be divided into

#### Three Different Belts.

Extending its entire length from north to south. The first includes that portion lying along the Sacramento (and above the town of Colusa), covering a considerable scope of country on both the east and west side of the river. This second, and by far the largest body of arable land, is found on the plains and adjacent foothills and valleys on the west; while the third, and most westerly division, is confined to a series of beautiful mountain valleys, Bear and Indian being numbered among the larger, coursing also north and south, but supplemented by many a cultivated little nook or more sequestered vale around the point and beneath the shadow of some diverging mountain spur.

#### The River Belt.

Having crossed the tule from Dunnigan in the upper edge of Yolo county, to Grand Island, a pleasant evening was passed with Mr. J. D. Winters, a neighbor years ago, in Carson City. He is wide-awake to the improvements made in farming machinery, and has made some important inventions himself; simplifying and cheapening in particular the construction and working of certain parts of the grain-lifter, which may possibly be hereafter more generally introduced. From this large ranch, near the southern boundary of the county, as far north as St. John's and Butte City, two lively villages not far from its northern limits, the soil along the borders of the river is a very rich alluvial deposit, and for the most part under a very fine state of cultivation. Colusa, the county seat, is situated on the west bank of the Sacramento, about midway in the belt and is quite a business place, being this center, not only of the trade of the rich section of its immediate vicinity, but also for that of much of the most distant settlements in the county. The town of Sycamore, a few miles below, and Princeton and Jacinto, some distance above, all have good surroundings and present an appearance of considerable thrift.

#### The Plains and Foot-hills.

Improvements have advanced very rapidly in the central belt, more especially along and near the line of the Northern railroad. College City, the most southern town and three miles from the road, derives its name from a flourishing institution established here (usually numbering 100 pupils and upwards), and is supported mainly by residents for educational privileges. Williams, the present terminus, has quite a number of large, substantial buildings, among the number a spacious hall fast approaching completion. It gives evidence of much thrift and promise for permanence. Arbuckle is the only town of any note south of the terminus immediately on this road, but on the projected line north, several rapidly growing villages are found. Occident, the smallest, comes first. Willows, the next in order, is the largest along the whole line, with a good country surrounding it. Germantown, a few miles above, is not far behind its neighbor in the race, and is settled up chiefly, as indicated by the name, from Germany.

Orland, in the upper part of the county, covers a good deal of ground, the buildings being usually small and mostly wooden, but hosts a large grist mill, now nearly ready for running.

#### The Mountain Valleys.

The principal villages of this western belt are

(Continued on page 359.)



## MECHANICAL PROGRESS.

## Our Mechanics Should Have Government Work.

It is notorious, says the *Commercial Herald*, that every Government vessel arriving here from the East is obliged to undergo repairs before being placed upon active service, and yet, after three or four years' mild cruises in the Pacific, they are ordered to Atlantic navy yards for extensive and costly repairs, although they could be done here much better, quicker, and at less than two-thirds the expense. The machine shops at Mare island yard are fully equal to any in the United States; the necessary material is bore in quantity and of superior quality; work can be prosecuted steadily and nearly every day in the year, unimpeded by snow storms and other disturbing causes which frequently prevail at the East; the cost of sending a frigate or sloop-of-war round the Horn with her complement of men, etc., is equal to about one-third the entire expenditure for necessary repairs; boiler and engine work of all descriptions can be done here equally as well and as cheaply as at the East, and there can be no valid reason why ships of war should be ordered from Pacific to Atlantic stations for repairs. It is admitted by naval officers that California salt-beef is much better than anything of the kind received from the other side, and we might go on and enumerate many other articles in support of our position. It was only with difficulty and after many urgent appeals that permission was given to build and equip a revenue cutter or two on this coast, but the experiment, as it was called, has resulted in triumphant success. It cost nearly as much to send the *Lincoln*, *Wayanda*, and others of that class around here, and put them in condition after arrival, as it did to build them. They were condemned and sold for a song soon afterward, while the *Oliver Wolcott, Jr.*, built here, has not yet cost a dollar for repairs, although several years have elapsed since she was launched and placed in active service. It cost \$20,000 gold to send the *Lincoln* to California and \$17,000 more to put her in condition after arrival, yet she was sold for a mere trifle shortly afterward. The manner in which California has been treated in this respect is simply infamous, and all the more so in view of the glaring fact that she contributes over \$3,000,000 per year to the Federal revenues.

## The Mechanical Treatment of Metals.

In a paper by Prof. R. H. Thurston, in the *Metalurgical Review*, under the above heading, the author states that it is perfectly obvious that means of effecting great changes for the better in the qualities of the commercial metals are available, and there is no reason why we should not have vastly more valuable materials than those with which our markets are generally supplied. He gives the following as the proper methods of preparation of metal to secure a maximum value:

1. Reduce this metal to the molten condition, flux thoroughly with such a flux as will remove first, all deleterious substances with which the metal may be contaminated; secondly, every particle of gaseous oxygen and of oxide, and, thirdly all other occluded gas liable to produce "blow-holes."

2. Cast the metal under heavy pressure, in order to secure maximum density and to close up every pore as perfectly as possible. If the metal is an alloy which is liable to liquation, it should be cast in a chill of sound iron and of considerable thickness.

3. If the metal is either iron or steel, produce any considerable change of shape which may be desired by rolling, by the drop press or by hydraulic forging, at a full red heat, and permit it to remain unused as long as possible, in order that the internal strain, unavoidable to some extent with any method of treatment, may be given time to become reduced by that process of flow which will ultimately relieve it. If stiffness and a more perfect elasticity are demanded, finish by the process of cold working, taking great care not to carry it so far as to seriously injure the continuity of the metal.

4. The bronzes and other metals of the inelastic and viscous class may be given very considerable modification of form by the process of working cold. The same precaution must be taken to avoid destruction of continuity, and thus by the production of incipient fracture permanently and seriously injuring it.

## Gauging Wire.

General dissatisfaction has been expressed with the old style of wire gauges. The subject was brought up at the last meeting of the American Institute of Civil Engineers, and a report from a committee was heard. The committee call attention to the inaccuracy of most of the gauges in use. These they divide into two general classes, first, fixed, and second, movable gauges.

The fixed gauges consist of a steel plate, either made with slots open at one end, the sides of which are intended to be parallel, with round holes and sometimes with a plug to fit the holes, or of a V, either cut into a plate of steel or of two bars placed together. These fixed gauges were found to be only approximately correct. Not only those made by different manufacturers did not agree, but in those

made by the same manufacturer there were often "very perceptible and annoying differences."

Two kinds of movable gauges are described, "sliding callipers with verniers and with or without a micrometer screw for adjustment and the micrometer screw gauge." The latter is spoken of as the simplest form and is recommended for adoption as the standard gauge. The committee recommend the abandonment of the fixed gauges and the practice of designating dimensions and sizes by number—meaning number "wire-gauge," as it is often written—for commercial use, and the adoption of the system of expressing signs in thousandths of an inch or fractions of a millimeter. There is probably nothing to prevent any one from doing the latter in this country if they choose, but at present the use of doing so is not apparent.

It is to be hoped, however, says the *Railroad Gazette*, that the barbarous old wire-gauges will be condemned to the scrap-heap and that the more accurate and precise micrometer gauges will take their places, and that instead of designing wire and plates as such a number "wire-gauge," which instead of being precise is quite the reverse, the practice of expressing such dimensions in thousandths of an inch will come into universal use.

## The Points Involved in a Joint.

In all wood-working the proper connection of the parts is an essential element, and in designing or executing joints and fastenings in wood-work, the following principles laid down by Prof. Rankine should be adhered to, viz.:

1. To cut the joints and arrange the fastenings so as to weaken the pieces of timber that they connect as little as possible.

2. To place each abutting surface in a joint as nearly as possible perpendicular to the pressure which it has to transmit.

3. To proportion the area of each surface to the pressure which it has to bear, so that the timber may be safe against injury under the heaviest loads which occur in practice, and to form and fit every pair of such surfaces accurately, in order to distribute the stress uniformly.

4. To proportion the fastenings so that they may be of equal strength with the pieces which they connect.

5. To place the fastenings in each piece of timber so that there may be sufficient resistance to the giving way of the joint by the fastenings shearing or crushing their way through the timber.

To these may be added a sixth principle not less important than the foregoing, viz.: To select the simplest forms of joints, and to obtain the smallest possible number of abutments. The reason for this is that the more complicated the joint, or the greater the number of bearing surfaces, the less probability there will be of getting a sound and cheaply made connection. To insure a fair and equal bearing in a joint which is not quite true, it is usual after the pieces are put together to run a saw-cut between each bearing surface or abutment; the kerf or width of cut being equal in each case the bearing is then rendered true; this is often done, for instance, with the shoulders of a tennon or the butting ends of a scarf, when careless workmanship has rendered it necessary. When the visible junction of two pieces is required to be as close as possible, and no great strain to be met at the joint, it is usual to slightly undercut the parts and give clearance on the inside.

THE TELEPHONE AS A FIRE ALARM.—We find the following in an English exchange. We have not seen the fact published in this country: Prof. Graham Bell's telephone gave the first notification of the fire at the Patent Office, but unfortunately what it said could not be understood. Nor is this to be wondered at when I tell you what happened. The model of the telephone deposited in the Patent Office was on trial by one of the officials, who suspected that his private office was occasionally entered by improper persons. He made the necessary connection with his own room at his hotel, and hoped to be apprised of the noise of entry, so that he might rush out and secure the offender. The first sounds were those of the burning office, a dull hissing noise, that engaged the attention of the official and of some friends that were with him in vain attempts at interpretation until the fire was fairly started. The language of fire was unknown.

REDUCING ALUMINIUM.—According to *Dingler's Journal*, in almost the only factory for the production of this metal, in Salindres, near Alais, the mineral bauxite is heated with soda in reverberatory furnace, the resulting aluminate of soda is extracted by means of water and alumina, precipitated by a stream of carbonic acid; this is then formed into balls, with salt and coal, and heated to a white heat in vertical retorts during the introduction of chlorine gas. The double chloride of soda and alumina, which distills over, is fused with the addition of 35% of sodium and 40% of cryolite as a flux, and the metal which settles at the bottom of the crucible is poured into molds.

HARD RUBBER BEARINGS.—The *Polytechnic Review* says: Hard rubber (vulcanite) on brass or any other metal will, when used under water, subject to friction, wear a dozen times longer than any two metals under the same usage, and hard rubber on hard rubber or glass is almost indestructible.

## SCIENTIFIC PROGRESS.

## Moonlight on Mars.

The following calculations concerning the moon of Mars (in *Scribner* for December) have been made by Lieut. Sturley, of the Naval Observatory, with the approval of Prof. Hall, the discoverer: We might at first conclude that the inhabitants of Mars, if such there be, would witness the extraordinary sight of two brilliant moons passing each other in the heavens above them, but a little further reflection will show that to all intents and purposes Mars has but one practical moon, and that as far as light reflecting is concerned the outer one is a most useless attendant. The inner moon being 15 miles in diameter and 3,500 miles away would from the surface of Mars subtend an arc of 23', which would give it an apparent size of about three-quarters of our moon.

Now the outer being but 11 miles in diameter and 12,000 miles away would subtend but about 3' of arc, and as the naked eye, that is, the human eye of this earth, can but barely see a celestial object which subtends 1' of arc, it follows that to the inhabitants of Mars their outer satellite would appear to be a little larger than Mars does to us. We may therefore conclude that for the people of Mars there is but one practical moon and that that one rises in the west.

Again, supposing that this inner moon should rise on a certain evening at 6 o'clock, it would set in the east at 11h. 34m., and rise again in the west at 5h. 9m. the following morning—set again at 10h. 43m. in the forenoon to rise once more at 4h. 18m. in the afternoon, and so on. Thus to the men of Mars the moon rises twice in the same night.

Let us see now how his moonlight nights would compare with ours. Supposing his moon and ours to rise at 6 o'clock in the evening. At 6 o'clock next morning we would have had nearly 12 hours with our moon above the horizon, while the Martians would have had light from theirs but 6h. 25m.—that is, counting from 6 o'clock in the evening to 6 o'clock the next morning. But, on the other hand, the Martians have their moon every night, which is a boast we on earth cannot make.

There is still another interesting phase of Mars' moons. Speeding through its orbit in 7h. 40m., each quarter will consist of but 1h. 55m.; thus, as in the former case, supposing it to rise at 6 o'clock in the evening, and at that instant of time to be full moon, at 7h. 55m. it will have reached its last quarter, at 9h. 50m. it will be new moon, and at 11h. 45m., eleven minutes after setting, it would reach the second quarter. Thus in one night the Martians will see their moon passing through all the phases, which with us and our moon require more than 27 days.

## The Composition of Wool.

At the recent meeting of the French Association for the Advancement of Science, held at Havre, M. Ladureau read a paper on the composition of wool, showing that the generally adopted opinion that this material contains mineral salts is absolutely without foundation. Actually pure wool contains no such salts whatever, and now-a-days it is cleaned and prepared for manufacture so admirably that very ordinary samples will leave no trace of them on careful examination, unless it be a very minute proportion of potash or soda absorbed in the process of washing. A very long series of experiments made by M. Renouard on numerous samples of different kinds of wool gave the average amount of ash in 100 grammes of wool as 0.645 gramme only, the most impure of all containing 1.24 gramme, while the finest and best prepared English wool yields but 0.02 gramme of ash in the quantity named. The proportions of different salts found in the average ash were as follows:

	Per cent.
Carbonate of potash.....	43.34
Carbonate of soda.....	17.16
Chloride of potash.....	14.15
Sulphate of potash.....	9.24
Carbonate of lime.....	6.07
Sulphate of lime.....	2.06
Phosphate of lime.....	0.70
Silicate of alumina.....	2.28
	100.00

Nitrogen, therefore, is absolutely absent and must be artificially added if wool refuse is to be used as manure. M. Cornwinder and Peligot endorsed these observations from their own experiences, and M. Ladureau expressed the opinion that when soda is found at all in prepared wool, its presence must be referred to the soap used in the process of cleansing the fleece.

A SICK WHALE.—A white whale (*Beluga borealis*) was lately carried to England from America for the Westminster Aquarium. It was very thin when it arrived, not having eaten anything for twelve days, and the spinous processes protruded two to three inches along its back. It was fed on eels, and seemed to improve rapidly, but died in a few days. Dissection proved that it died of inflammation of the lungs, which has surprised people, as occurring in an aquatic species. But a whale's fat is its clothing, and it is not strange that it should catch cold when its clothing is used up.

## The Antiquity of Man.

This hoary topic has been last discussed by Prof. Dawkins, of the Manchester, England, Geological Society. He thinks that in taking stock—to use a mercantile term—of the net results of geological and palaeontological inquiry during the last session, the additions to our knowledge had consisted in detail rather than the discovery of great principles; and the ground already conquered from the region of the unknown had been resurveyed and more minutely parcelled up, instead of being increased by large slices of territory. He referred to the recent discoveries at Creswell Crags, on the borders of Derbyshire and Nottinghamshire, by which the fact was established that even in the palaeolithic age the hunters of the reindeer, horse, mammoth and other creatures were progressive, and that the cave-dwellers of the pleistocene age were to be looked upon from this same point of view as mankind at the present time—as one man, always living and incessantly learning. Among the additions made by these caves to the fauna of the north of England was that of the great saber-toothed *Machairodus latidens*, which hitherto had only been met with in two caverns—in Keut's Hole in Devonshire, and that of Baume in the Jura. The figure of a horse upon a rib bone was identical with those left behind by the hunters of reindeer in the caves of Auvergne, and therefore proved that the inhabitants of the Creswell caves during the time when this upper stratum was being accumulated was in the same stage of artistic culture as the cave-dwellers of southern France and of Switzerland. From the discoveries in the caves in France, he (Prof. Dawkins) had arrived at the conclusion that these people were represented in the present age by the Eskimos. This, however, must be viewed as a probable hypothesis rather than a well ascertained fact. The evidence offered by all the caves in the area from the Alps and the Pyrenees, as far north as Derbyshire, was clear that palaeolithic man lived in Europe while large numbers of reindeer were also living here; or in other words, in the pleistocene state, when the Arctic animals were abundant.

ACTION OF NITRO-GLYCERINE.—The temperature developed on the explosive combustion of nitro-glycerine, says the *Engineer*, has not been accurately ascertained, but as the combustion is much more perfect than is the case with gunpowder, it is probably much greater, and has been assumed to be more than twice as great. One volume of powder gives 190 volumes of gas at the ordinary temperature; in consequence of the heat developed, this gas expands to four times this volume, giving 760 volumes of gas directly after the explosion. One volume of nitro-glycerine gives 1,300 volumes of gas at the ordinary temperature, and assuming as pretty nearly correct that the heat developed is two and a half times as great, we should have the gases expanded to 10 times their volume at ordinary temperatures, of 3,000 volumes of hot gas; so that according to volume the strength of the nitro-glycerine is 17 times that of gunpowder. But in consequence of the enormous velocity of combustion of nitro-glycerine, its impact effect is still more increased. With nitro-glycerine larger masses of rock can be operated at one blasting, in consequence of the severe shattering power which its rapid combustion confers upon it. At the slate quarries in north Wales, where nitro-glycerine was for some time used, a single blast with nitro-glycerine sufficed where previously four or five blasts with gunpowder were required. Similar favorable results were obtained at Freiberg and in Belgium.

JAPANESE BOTANY.—An interesting evidence of Japanese education and enterprise was brought to the *Alta* office the other day—a book containing samples of 100 species of Japanese wood, with the botanical name of the genus and the species in Latin and in Japanese, and notes in Japanese. Three samples are given of each species; one transverse and two longitudinal, and of these one radial and the other tangential, or at right angles to the radius. Thus the grain of the wood is shown in every position. The samples are very thin, some of them not the hundredth part of an inch, so that when pasted in the book, they do not make it clumsy. We presume that it is entirely the work of natives of Japan, and though the idea is not original with them, the manner of its execution does great credit to their country. The *Alta* announces that Justin P. Moore has for several years been working at intervals to produce a similar book of the woods of California.

HONEY AND THE MICROSCOPE.—Under the microscope, the solid part of honey is seen to consist of myriads of regularly-formed crystals; these crystals are for the most part exceedingly thin and transparent, and very brittle, so that many of them are broken and imperfect; but when entire they consist of six-sided prisms, apparently identical in form with those of cane sugar. It is probable, however, that these represent the crystals of dextrose, as they occur in honeys from which cane sugar is nearly or wholly absent. Intermingled with the crystals may also be seen pollen granules of different forms, sizes, and structure, often in such perfect condition that they may be referred to the particular plant from which the juices have been gathered.



## Table of Highest and Lowest Sales in S. F. Stock Exchange.

Name of Company.	Week Ending Nov. 11.	Week Ending Nov. 18.	Week Ending Nov. 25.	Week Ending Dec. 2.
Alpha.	137 1/2	124 1/2	124 1/2	124 1/2
Andes.	65 1/2	1 1/2	1 1/2	1 1/2
Baltimore Con.	2 1/2	1 1/2	1 1/2	1 1/2
Belcher.	5 1/2	5 1/2	5 1/2	5 1/2
Best & Belcher.	22 1/2	22 1/2	22 1/2	22 1/2
Bullion.	6 1/2	6 1/2	6 1/2	6 1/2
California.	4 40	2 40	3 40	3 40
Chollar.	30	27 1/2	27 1/2	27 1/2
Chollar-Potosi.	36 1/2	33 1/2	33 1/2	33 1/2
Confidence.	5 1/2	5 1/2	5 1/2	5 1/2
Con Imperial.	95 1/2	80 1/2	85 1/2	85 1/2
Con Virginia.	23 1/2	23 1/2	23 1/2	23 1/2
Crown Point.	6 1/2	5 1/2	5 1/2	5 1/2
Coyote.	5 1/2	5 1/2	5 1/2	5 1/2
Dan.	48 1/2	25 1/2	35 1/2	40 1/2
Eureka Con.	45 1/2	44 1/2	40 1/2	36 1/2
Exchequer.	5 1/2	5 1/2	5 1/2	5 1/2
Geddes & Bertrand.	5 1/2	5 1/2	5 1/2	5 1/2
Gen Thomas.	13 1/2	13 1/2	12 1/2	12 1/2
Grand Prize.	1 30	1 1/2	1 1/2	1 1/2
Gila.	75 1/2	90 1/2	80 1/2	1 10
Golden Chariot.	10 1/2	8 1/2	8 1/2	8 1/2
Gould & Curry.	8 1/2	8 1/2	8 1/2	8 1/2
Hale & Norcross.	10 1/2	10 1/2	10 1/2	10 1/2
Hussey.	35 1/2	35 1/2	35 1/2	35 1/2
Julia.	2 60	2 20	2 20	2 20
Justice.	13 1/2	9 1/2	10 1/2	11 1/2
Jackson.	4 1/2	4 1/2	4 1/2	4 1/2
K. K. Con.	6 1/2	5 1/2	5 1/2	5 1/2
Kentuck.	25 1/2	20 1/2	25 1/2	25 1/2
Krickerbocker.	25 1/2	20 1/2	25 1/2	25 1/2
Lady Bryan.	11 1/2	11 1/2	11 1/2	11 1/2
Lady Wash.	11 1/2	11 1/2	11 1/2	11 1/2
Leopard.	11 1/2	11 1/2	11 1/2	11 1/2
Leviathan.	2 90	40 1/2	50 1/2	50 1/2
Leeds.	2 90	2 90	2 90	2 90
Madison.	1 1/2	1 1/2	1 1/2	1 1/2
Manhattan.	25 1/2	25 1/2	25 1/2	25 1/2
Meadow Valley.	25 1/2	25 1/2	25 1/2	25 1/2
Mexican.	16 1/2	11 1/2	12 1/2	13 1/2
North Con Virginia.	1 1/2	1 1/2	1 1/2	1 1/2
North York.	1 1/2	1 1/2	1 1/2	1 1/2
Niagara.	1 1/2	1 1/2	1 1/2	1 1/2
Northern Belle.	1 1/2	1 1/2	1 1/2	1 1/2
New Coso.	70 1/2	55 1/2	50 1/2	50 1/2
Occidental.	1 1/2	1 1/2	1 1/2	1 1/2
Ophir.	42 1/2	26 1/2	26 1/2	26 1/2
Overman.	24 1/2	16 1/2	23 1/2	24 1/2
Pacific.	1 1/2	1 1/2	1 1/2	1 1/2
Phil Sheridan.	1 1/2	1 1/2	1 1/2	1 1/2
Potosi.	40 1/2	8 1/2	8 1/2	8 1/2
Prospect.	40 1/2	8 1/2	8 1/2	8 1/2
Raymond & Ely.	9 1/2	8 1/2	8 1/2	8 1/2
Rock Island.	25 1/2	20 1/2	20 1/2	20 1/2
Savage.	3 1/2	3 1/2	3 1/2	3 1/2
Seg Belcher.	34 1/2	37 1/2	34 1/2	37 1/2
Sierra Nevada.	5 1/2	4 1/2	4 1/2	4 1/2
Silver Hill.	3 1/2	3 1/2	3 1/2	3 1/2
South Chariot.	4 1/2	3 1/2	3 1/2	3 1/2
Succor.	1 1/2	1 1/2	1 1/2	1 1/2
Trojan.	1 1/2	1 1/2	1 1/2	1 1/2
Union Con.	8 1/2	6 1/2	6 1/2	6 1/2
Utah.	70 1/2	40 1/2	30 1/2	25 1/2
Wells Fargo.	1 30	80 1/2	1 40	1 10
Yellow Jacket.	12 1/2	9 1/2	12 1/2	13 1/2

## Sales at S. F. Stock Exchange.

Friday A. M. Nov. 30.	Saturday A. M. Dec. 1.
405 Alpha.	124 1/2
1122 Andes.	1 1/2
520 Atlanta.	1 1/2
1335 Best & Belcher.	22 1/2
170 Bullion.	6 1/2
1225 Benton.	5 1/2
1270 Boyle.	5 1/2
170 Chollar.	36 1/2
500 California.	29 1/2
820 Con Virginia.	24 1/2
775 Crown Point.	6 1/2
155 Con Imperial.	1 1/2
50 Caledonia.	4 40
25 Confidence.	5 1/2
150 Dayton.	50 1/2
800 Exchequer.	45 1/2
225 Gould & Curry.	10 1/2
2015 Hale & Norcross.	10 1/2
400 Joe Scates.	40 1/2
2920 Justice.	12 1/2
100 Kentuck.	25 1/2
100 Kossuth.	35 1/2
115 Lady Wash.	9 1/2
1270 Leviathan.	2 90
1330 Mexican.	16 1/2
1140 New York.	2 10
500 North Con Vir.	1 1/2
2745 Ophir.	42 1/2
370 Overman.	24 1/2
375 Rock Island.	25 1/2
2175 Succor.	5 1/2
2000 Savage.	11 1/2
785 Sierra Nevada.	5 1/2
130 Silver Hill.	3 1/2
175 South Justice.	1 1/2
40 St Louis.	40 1/2
300 Senator.	3 1/2
120 Silver Hill.	3 1/2
700 Trojan.	1 1/2
550 Union Con.	8 1/2
160 Utah.	70 1/2
50 Ward.	85 1/2
300 Wells Fargo.	35 1/2
1070 Yellow Jacket.	12 1/2

735 Silver Nevada.	60 1/2	450 Leopard.	124 1/2
35 Seg Belcher.	40	835 Mexican.	15 1/2 @ 16
175 South Justice.	1	100 Mendocino Valley.	25c
480 St Louis.	40c 45c	20 Manhattan.	25c
500 St Paul.	75	200 Modoc.	45 1/2
1230 Silver Hill.	23 1/2 35	2000.	15 @ 15 1/2
700 Trojan.	1 40 10 1/2	530 Northern Belle.	15 1/2 13
550 Union Con.	73 7/8 75	75 Ophir.	51 1/2 51
160 Utah.	14 1/2 13	950 Overman.	23 1/2 24
50 Ward.	85c	110 Raymond & Ely.	73 7/8 77
250 Woodville.	14	20 Rye Patch.	4
300 Wells Fargo.	35 1/2 30 1/2	1520 Silver Nevada.	12 1/2 14 1/2
1070 Yellow Jacket.	12 1/2 12	625 Savage.	6 1/2 5

455 Alpha	19	340 Succor	54	51	
1520 Argentina	1.60	121 75	120 Seg Belcher	46	47
1070 Alps	7	66	200 Tiptop	1	60
285 Best & Belcher	21	22	810 Union Con.	7	77
100 Bodie	2	62	385 Utah	14	12
300 Belmont	7	56	1835 Yellow Jacket	12	12
100 Belle Isle	2	00	Monday A. M. Dec. 3.		
215 Best	7	66	385 Ahaha	14	31
100 Becht	1	00	2000 Belmont	1	00
295 California	2	12	965 Best & Belcher	23	22
200 Con Virginia	2	24	1410 Belcher	7	66
1310 Caledonia	4	40	770 Bullion	6	66
105 Chollar	4	34	615 California	2	24

100 Dayton	456	70	Con Virginia	241/2	241/2
475 Day	4 25/64	4865	Cou-Imperial	1 20/61	15
610 DeFrees	506	1290	Crown Point	64/64	64/64
185 Eureka Con.	36	520	Chollar	47/48	47/48
450 Grand Prize	124	3870	Dancey	60/65	65/65
50 Gila	147/4	1545	Eschquer	43/58	43/58
600 Gould & Curry	10/101	1555	Gould & Curry	124/111	111/111
160 Golden Chariot	11/11	1555	Hale & Nor.	12/15	12/15
400 Hornet	25	1335	Hale & Nor.	12/15	12/15
900 Hale & Nor.	10/101	280	Kentuck	58/58	58/58
700 Independent	1 30	293	Mexicau	16/16	16/16
100 Jackson	3	3105	Ophir	53/51	51/51
685 Justice	13/131	1105	Overman	26/22	22/22

250 Leeds.	2.95	1810 Savage.	137 1/2
1125 Modoc.	50c	40 Seg Belcher.	50 2/4
100 Manhattan.	11 1/2	2170 Succor.	5 1/2
600 Meadow Valley.	25c	815 Utah.	16 1/2
635 Mexican.	16 1/2	1215 Union Con.	75 1/2
140 Northern Belle.	13 1/2	1065 Yellow Jacket.	13 1/2
1000 New York.	23c 1/2	AFTERNOON SESSION.	
3450 Navajo.	1 1/2	1700 Argentina.	1 1/2
1130 Ophir.	5 1/2	1700 Argenta.	1 1/2
10 Raymond & Ely.	7 1/2	1260 Alps.	74 1/2
840 Silver Hill.	3 1/2	830 Andes.	60 1/2
100 Silver Prize.	1 1/2	320 Belmont.	80 1/2
1120 Star.	3 1/2	5150 Belle Isle.	20 1/2

1815 New York.	1 80
1110 Ophir.	42 1/2
3045 Caledonia.	4 40
150 Challe.	1 40
375 Day.	3 80
845 DeFrees.	50 1/2
1300 Dayton.	50 1/2
835 El Dorado.	1 30
375 Eureka Con.	38 1/2
960 Exchequer.	45 1/2
100 General Thomas.	25 1/2
290 Golden Chariot.	11 1/2
350 Grand Prize.	1 30
430 Gila.	75 1/2
400 Hornet.	25 1/2
100 Hussey.	25 1/2
1400 Independent.	1 30
500 Joe Scates.	40 1/2
1050 Julia.	3 35
1130 Justice.	13 1/2
25 K & C Con.	1 30
200 Kossuth.	35 1/2
1960 Leviathan.	2 80
265 Leeds.	2 80
650 Lee.	50 1/2
305 Leopold.	1 30
350 Lady Wash.	9 1/2
1500 Modoc.	45 1/2
3150 Navajo.	1 10
1345 Con Virginia.	24 1/2
240 Northern Belle.	1 1/2
170 New Coso.	70 1/2
2635 New York.	2 20
200 North Carson.	2 20
290 Ophir.	42 1/2
365 Overman.	25 1/2
50 Occidental.	1 30
90 Raymond & Ely.	9 1/2
545 Ely & Patch.	5 1/2
100 Rock Island.	25 1/2
450 Silver Price.	1 10
30 Silver King.	1 10
300 Solid Silver.	3 1/2
1120 St.	3 1/2
2900 St. Louis.	40 1/2
1750 Silver Hill.	3 1/2
250 Tiptop.	1 40
1650 Trojan.	1 30
935 Woodville.	1 30
250 Wells Fargo.	35 1/2

WEDNESDAY A. M., NOV. 28.		THURSDAY A. M., DEC. 6.	
175 Alpha.....	13	625 Alpha.....	154@16
1180 Alta.....	133@19	2670 Alta.....	18c@19
315 Best & Belcher.....	20@20	2040 Bullion.....	81@83
505 Belcher.....	61@62	950 Belcher.....	17c@18
840 Bullion.....	61@62	200 Best & Belcher.....	21@22
100 Baltimore Con.....	10	6055 Con Imperial.....	14@15
1740 Benton.....	2@3	50 Confidence.....	67@7
1220 Boyle.....	95c@1	470 Challenge.....	1
690 Calcedonia.....	4.15@4.20	5345 Crown Point.....	81@9
265 California.....	28	180 Chollar.....	43c@44

230 Chollar	35 1/2	3625 California	29 1/2
925 Crown Point	6 1/2	1420 Caledonia	5 1/2
15 Confidence	5	1700 Dayton	5 1/2
1365 Con Imperial	1.05 @ 1.10	300 Dayton	45c
800 Dayton	50 1/2 55c	1700 Exchequer	57 1/2
1045 Exchequer	4.40 @ 4.45	910 Gold & Curry	107 1/2
275 Gold & Curry	9 1/2 @ 9.50	1195 Hale & Nor	12 1/2
575 Hale & Nor	12 1/2 @ 12.50	1000 Independence	12 1/2
1200 Justice	12 1/2 @ 12.75	700 Julia	3 1/2 @ 3.20
575 Julia	2 1/2 @ 2.65	625 Kentucky	57 1/2
400 Kentucky	50 1/2	795 Mexican	157 1/2
400 Leviathan	50c	750 New York	131 1/2
50 Lady Wash	50c	420 Overman	28 @ 2.90



# MINING SUMMARY.

The following is mostly condensed from journals published in the interior, in proximity to the mines mentioned.

## California.

### AMADOR.

**STRECK COAL.**—Amador Ledger, Dec. 1: We are informed by Alex. Thompson, of Buck's Vista, that Wm. Cook, of Jackson valley, is boring for an artesian well, a few days ago, struck a seam of coal of unknown thickness. The coal is said to be far superior to any heretofore discovered in the valley. Indeed, the coal is good enough to heat iron to the welding point—something that blacksmiths cannot do with lone coal. In case the bed proves to be extensive, which there is no reason to doubt, the discovery is of great value and will have an important bearing upon the future of Jackson valley.

The Kennedy mill is expected to be ready for the commencement of hostilities upon the huge piles of quartz, which have accumulated on the dumps week after week.

The Tallman company have secured drilling machinery of the latest pattern, worked by compressed air.

**MISCELLANEOUS.**—The Yoakes gravel mine, at Butte, is running with a small head of water. It prospects big and will give a good account of its wealth this season. The Crown Point mill and mine at Drytown have started up. Rumors are current of a big strike in the Tallman. No particulars are known. The Gover looms up as the prince of Amador mines. It continues to develop grandly.

**WORK COMMENCED.**—Amador Dispatch, Dec. 1: The work of prospecting the old Moore mine, near Scottsville, about a mile south of Jackson, was commenced in good earnest last Monday morning, by Messrs. Hewitt, Hill & Co., which was bonded by them a few days ago for one year. It is a well known fact that a large amount of very rich rock was taken out of this mine in the early days of quartz mining in this county, and there is but little doubt now, that under the improved methods of extracting gold from quartz, the mine can soon be made a valuable piece of property. The gentlemen who have undertaken this enterprise are well known to be responsible men and practical miners.

### BUTTE.

**COLD.**—Oroville Mercury, Nov. 30: Last Friday the Spring Valley company sent down a couple of gold bars valued at \$55,000. This is the beginning of a clean-up that will last two or three weeks.

Just across the river from town is the Powers' claim, mining day and night. A large volume of water falls over the bank upon the pile of gravel that has fallen down, while from below the Chief sends against it a stream with a force sufficient to make the gravel fly in every direction. It is said that this stream has force enough to batter down any brick wall in town. The claim is turning out a golden harvest each month.

**BIO BAR.**—J. C. Logan and a party from San Francisco, visited the Big Bar mining claim on the North Fork last Monday. Everything is in complete readiness to run as soon as they have a sufficient head of water. The gravel prospects well and they have an abundance of it before them. From two pans taken from near the bedrock they got about seven lbs. The gravel in the immediate vicinity of where this was taken from is equally rich. How much of it there is, is a deeply interesting question to the owners, who are very anxious for the rains to come in order to fully test the claim. It may prove to be the best kind of a claim, and it may be a delusion as many another claim has proved.

**QUARTZ MINING.**—Mining in quartz in Butte county has been carried on in times past with different degrees of success. We have yet to learn that any who have been engaged in the business, have made a success of it. Still there are a number of ledges that are at the present time being worked. Over in the Evansville mining district is the Honcutt quartz mining company, hard at work in the hope of finding a good ledge. The members of the company all belong in Santa Clara. They have a four-stamp steam mill and all the requisites for crushing rock. They are now down on the Honcutt ledge 100 feet and have a small vein of pay rock that promises well if it continues on. On the way down they have passed through various stratas, some of which were quite rich. We met J. H. Miller, the Superintendent, in town this week, and from him learned that the water was rushing in on the ledge so fast that it was necessary to get a pump. He was in for that purpose. We hope to hear that the ledge is a good one, and that it will pay. Near it is one worked by Mr. Griffith that is rich in places. If the mill was on his claim it would turn out a good day's work each day.

### CALAVERAS.

**EXTREMELY RICH QUARTZ.**—We learn that Mr. Andrew McFadden lately discovered a very rich quartz ledge on his ranch, on the West Point road, about three miles above here. Mr. McFadden crushed up five pounds of the rock, obtaining two ounces and 84 in gold. Richer rock than that has seldom been heard of in this country, you take it. We have not learned how extensive the deposit is, but shall await further intelligence with regard to development with lively interest.

**EXPLOSIVE.**—Seventeen giant powder cartridges blew up in one of the levels in the San Bruno at Mosquito the other day. Fortunately the men bad just left the drift and no one was hurt. A candle dropped into the box among the cartridges and primers.

**GWIN MINE.**—While we have nothing particularly new from the Gwin mine our intelligence is altogether favorable. The stopes on the 1300-ft level continue to yield their usual quota of good ore, keeping the batteries in constant employment. The work of running the 1300-ft level is progressing steadily. The outer edge of the chute has been reached, the ledge showing very wide, the ore as yet being inferior in quality. That it will improve, however, there is no question, that having been the unfailing result in all the levels above. The work of repairing the lower mill is nearly completed, which will render 24 additional stamps available. The mine continues its average yield per month.

### EL DORADO.

**WAITING FOR WATER.**—Mountain Democrat, Dec. 1: Ben Mason reports that the mine owned by himself and Mr. Kelsoe, of the Pacific house, is now in trim, ready for a run as soon as sufficient water comes. They are digging a ditch, which, when completed, will bring water from Silver creek; but, for this season, will have to depend on catchment water on this side of the divide. The mine is situated about two miles east of the Pacific house.

The Park canal and mining company is in the same condition, the water of Camp creek not being available yet, and Park creek being too low to furnish a supply to run the mine.

### INYO.

**PROSPECTING.**—Coso Mining News, Dec. 1: Quite a large number of men are taking advantage of the cool weather, and have gone, in different directions prospecting. Plenty of leads yet to be found in this section.

**New Coso.**—It is reported that an immense strike has been made in the Lucky Jim within this last few days.

**BRIDGES SUPPLIES.**—Last Sunday, Peter Taylor, Superintendent of the Emigrant mining company, shipped to San Francisco, per Wells, Fargo & Co.'s express, 149 pounds of fine silver bullion, valued at \$2,000. Same day the Rex Montis company shipped 173 pounds, valued at \$1,600. On Saturday, the 24th (after we had gone to press), J. S. Childs, Superintendent for the lessees of the Hidalgo mine, shipped to the same company, 173 pounds of silver bullion, valued at \$1,600. The same day, per Cerro Gordo freight company, to San Francisco.

**THE NEW MILL.**—Inyo Independent, Dec. 1: Lumber and timbers from Stewart's mill, at Big Pins, has been continually forwarded to the Rex Montis mill for the new addition. Five more stamps are to be added to the battery, with pans and all other machinery requisite for a complete institution.

**NEAR STRIKE.**—Messrs. Bowen and English, through the good offices of an Indian, are reported to have made a good strike down the San Lucas canyon, on the eastern slope from Cerro Gordo, in the shape of a large quartz ledge, showing fine, coarse gold.

**LEE DISTRICT.**—The Union Con. furnace at Cerro Gordo has been working some of the rich chloride ores from Lee district, shipped in by C. S. Mott, with results satisfactory to all parties.

**UNION CON.**—The new works are in full operation to the 700-ft level, the repairs on the shaft below that point to the bottom of 900 still going on. It was mostly filled up, and will require some time to complete the work of clearing. Some ore is coming out, but so far nothing like such extensive bodies of ore as distinguished the old works have been encountered. One furnace is in steady operation upon ores from the old workings. The San Felipe silver ledge, now opened at several levels, contributes its quota of rich ore, and the statement is made to us by a stockholder in the company that the last month's work of the single furnace has produced the sum of \$27,000 clear.

### NEVADA.

**FLEMING.**—Nevada Gazette, Dec. 1: The Fleming mine, situated on the bank of Deer creek, will be one of the bonanzas when it is fully developed. He has now on the dump about 20 tons of rock, which will pay from \$30 to \$40 per ton, and has a ledge in the face of the tunnel, which, when mined, could be worked by a four-foot vein and looks as well as any that he has now on the dump. He has some difficulty in holding the rock from the bed of the creek, but this will be overcome in a few weeks.

**THE JOHNNY SCHMIDT MINE.** Located near Wood's ravine, is one which can be easily worked. When they get their machinery in full working order they intend to sink an incline, from which they can take out about twice as much rock as they could with the rock they are at work by at present. Their ledge is from three to three and a half feet in thickness, and is good rock, paying all the way from \$30 to \$50 per ton.

**VALUABLE GROUND.**—San Juan Times, Dec. 1: The Patterson placer mining company, embracing about 400 acres, owned by Joseph Hustler, Wm. Bristow, J. Nan Kervis, John T. Morgan and many others, and situated near the town of Pioche, is about to apply for a United States patent. This claim embraces some of the most valuable ground on the ridge, extending from Chimney hill to the south line of the Badger Hill company's ground. It is contemplated by the owners of the Patterson placer mine, as soon as their title is made secure by patent, to run a tunnel into the ground from the Badger hill side. This will require much time and a heavy outlay in money; but, when completed, the owners will be amply repaid.

**WEATHER.**—Nevada Transcript, Dec. 1: This kind of weather is rough on this placer miner and the farmer. From appearances two weeks ago, we should have predicted a heavy rainfall during the present winter; but the weather changed and at the present time the air is as balmy as spring. Just think of roses in bloom in the heart of part of November and ripe strawberries in the market.

**ROYAL.**—One of the most promising mining properties in the county, located on Piety hill, on the old Grass Valley road, formerly owned by Geo. W. Smith, a widely known Nevada county man, has recently passed into the hands of a party of San Francisco capitalists, who have organized a company under the name of the Royal mill mining company. The property embraces a tract of 160 acres, well timbered and watered. The claim is 5,000 feet in length by 200 in width. The ledge is what is known as a north and south ledge, with a dip to the east of 45°. The property is secured by Government patent and has long been regarded as one of the most promising in the State. It has been developed by drifts and shafts to the extent of 1,000 feet. The character of the rock is from medium, averaging \$30 per ton, with deposits of very rich ore, running from 10 cents to \$1 per pound. The present machinery is capable of working the mine to a depth of several hundred feet. A 10-stamp mill has just been erected near the property, within a convenient distance of the mine. It is the intention of the company to actively prosecute work and to fully develop the property to the interest of the stockholders, with a certainty of making it a dividend-paying mine in a few months.

### SIERRA.

**RICH DRIFT.**—Mountain Messenger, Dec. 1: The Iowa company are getting out some very rich drift. The richness of that mine is no longer problematical.

**EXPENSES.**—Experts and capitalists from the Bay have been up looking at the Monte Cristo quartz company's property.

**ALL READY.**—The Pioche company has all ready to run a few days since and is now, probably, pushing down their shaft. The machinery works finely.

**FINE PROSPECT.**—The Brush Creek mine has a fine prospect for quartz. The ledge has again been struck at a depth of over 200 feet, and with such richness as former workings. The vein is no doubt a true fissure, and will extend downward indefinitely without doubt.

**WILBOURN CON. Mf. Co.**—This company, owned by Wm. Wilbourn and others, is located on Thompson ridge, about four miles from Whitney's upper saw mill. A shaft was sunk 80 feet last fall, but was abandoned on account of water. The company have now commenced to run a tunnel, which will be about 500 to 600 feet in length. It is expected will tap the channel some 40 feet below the bottom of the shaft, which was in fine looking gravel when work was stopped. The company started their tunnel so as to be sure and be low enough. If a pay channel is found it will be the means of opening up a large amount of mining ground. Messrs. Foss & Thompson have the contract for running the tunnel. They are also owners of claims in the Pioche district. Wilbourn has taken a great interest in the development of mines in this ridge, and it is mainly through his instrumentality that the above work is going ahead.

### SONOMA.

**GEORGIA QUICKSILVER MINE.**—Healdsburg Enterprise, Dec. 1: The Georgia is situated about 2½ miles southeast of Pine Flat, and is, in Mr. Nixon's judgment, destined to become one of the most valuable mines in the State. He is an old prospector, and says he has never seen ore so equal that found in the Georgia. He located the mine November 27th, 1875, and started a tunnel. The mine afterwards passed into other hands, and the work of development was only just commenced when the great decline in the market value of quicksilver caused a cessation of work, which has never been revived. We have specimens of ore from this mine that are remarkable for their richness, and we believe, like Mr. Nixon, that the time will come when the Georgia will be one of the most prominent and best paying tin mines in California.

**TIBURCIO PARROT, OF SAN FRANCISCO,** was up to look at the mine recently; should it pass into his hands, he has the capital to fully develop it. At all events, it is certain to be developed.

### TUOLUMNE.

**WATER.**—Tuolumne Independent, Dec. 1: There is about 75 inches of water in the Phoenix reservoir, enough to supply Sonoma, and with a few firearms for militiamen. The springs are raising, and water in the reservoir is increasing; it now being water-tight. Were it not for this receptacle, our citizens would be in a bad fix, as there would be no water to run the pump, which raises a supply into the distributing reservoir on Gold Mountain. Water is also run every night into the Cannon Hill reservoir for the purpose of filling the Phoenix.

The Tuolumne Water Co. are now all repaired in first-rate order, the Phoenix reservoir being rebuilt in a substantial manner, and hands discharged. The ditches have all been cleaned out, the flumes repaired, and the whole line of works are in first-class condition. All is now ready for the clerk of the weather to shower down his blessings.

## Nevada.

### WASHOE DISTRICT.

**UTAH.**—Gold Hill News, Dec. 5: The north drift on the 1150-ft level is steadily advancing, the face in porphyry. The week has been expended in repairs and enlarging the south drift on this level, so that no crosscutting from this drift has yet been attempted. The north and south drifts on the 1250-ft level are each advancing in more favorable ground than for some time past.

**COK VIRGINIA.**—Daily yield 600 tons of ore. In addition to the 29 stamps added recently to the California battery mill, the Nevada mill has been started up on ore from the mine. The ore stopes on all these levels are looking well and yielding rich ore, and the prosperity of the mine appears as great as at any time during the past two years. On the 1750-ft level the upraise to connect with the level above is making steady progress. The main drift on the main drift connecting with the C. & C. shaft are making good progress. Another crosscut, No. 3, has also been started on this level. On the 1650-ft level the main south-west drift is being rapidly enlarged to make a more convenient transit for the ore. On the 1400-ft level the ore continues to improve steadily and is of a very rich character. On the 1200-ft level the ore stopes continue a fine yield of rich ore. The yield of bullion for the month of November is amply sufficient to insure the payment of the regular monthly dividend of \$2 per share.

**CALIFORNIA.**—Daily yield, 650 tons of ore. The mills are kept steadily running on ore from the mine to their fullest capacities, everything working finely and the bullion returns being fully up to the usual rich standard. The ore stopes are yielding rich ore at almost every point. On the 1840-ft level the south drift is steadily advancing, the face still in that portion of the mine. On the 1750-ft level the north lateral drift and the east crosscuts from the same are being pushed vigorously forward, the ore prospects at almost every point continuing of the most favorable character. Sinking No. 3 winze east of the ore vein, below this level, is making very steady and favorable progress. On the same level the enlarging and timbering of the main connecting drift with the C. & C. shaft is going steadily forward. On the 1650-ft level the lateral drift from west crosscut No. 3 to connect with west crosscut No. 4 continues in good ore. The yield of bullion for the month of November will not fall much if any short of \$1,000,000, insuring the payment of the regular monthly dividend of \$2 per share.

**GRANITE.**—The south drift on the 1400-ft level is steadily advancing, this ore in the face of the drift showing a steady and favorable improvement. A station is being chambered out some distance south of the shaft on this level for the purpose of sinking a winze downward on the ore vein. On the 1200-ft level it is confidently expected that a connection will be made with the Caledonia to-day. This will give a desired opportunity for crosscutting the ore vein in that portion of the mine.

**SAVAGE.**—The water is being held at a point in the main incline a little above the 2100-ft level, until a large tank pit can be blasted out and a pump station put in 50 feet below the 2000-ft station. This is being done with all the expedition possible.

**NORTH CON. VIRGINIA.**—Sinking the main shaft has been resumed and is being pushed forward with all the energy possible. The shaft will soon have attained a sufficient depth to open the 1350-ft level. Preparations are shortly to be commenced for the erection of machinery with a sufficient power to prospect the mine to the depth of 3,000 feet or more.

**YELLOW JACKET.**—On the 2200-ft level the main drift east is in 570 feet, face in very hard material, consisting of porphyry and quartz. The drift north at the same level toward the Imperial is in 344 feet, face in quartz and porphyry, looking very favorable for ore. The new shaft is sinking in heavy ground and still requires double timbering or false sets to guard against pressure. During the month of November, 77 feet were added to the depth of the shaft, and its total depth at present is 1,022 feet.

**LAURELASMITH.**—On the 850-ft level the main drift east is being steadily advanced through very favorable looking ledge matter. Some hot water is seeping in at the face, indicating proximity to the ore vein. The drift south on this level, which corresponds with the 1000-ft level of the Justice, is also being actively pushed ahead and will connect with the Justice in about two months.

**GOULD & CURRY.**—The north drift on the 1000-ft level has reached the north line and is being pushed ahead by the Best & Belcher to prospect their mine or that level. A joint crosscut is being started on the Best & Belcher line to crosscut the vein at that point.

**BELCHER.**—The winze below the 1000-ft level is 175 feet deep to-day, and in good looking quartz, following the footwall of the ledge. On the 1900-ft level the main lateral drift south is in 500 feet, and shows good looking streaks of quartz and porphyry in its face. On the 2000-ft level the main drift east, after passing through a fine vein of quartz about 20 feet in width, has its face now in quartz and porphyry. The air shaft incline is now down 25 feet below the 2100-ft level, and the station timbers are put in for that level, the opening of which will be actively proceeded with as soon as practicable, drifting east to the vein and the following south.

**SILVER HILL.**—The expectation that the connection with the Justice mine, on the 600-ft level would be completed by the first of the week, but an actual survey showed a difference between the real measurement and the estimates of 36 feet, which it will take nearly the whole of the present week to overcome. Just as soon as this connection is completed and a current of air obtained, crosscutting the north line and the level will be commenced. Sinking the main incline is making excellent progress. The machinery is all in splendid working condition.

**MEXICAN.**—During the first part of the week the prospecting operations were all suspended on the 1465-ft level. The north drift on the 1000-ft level is steadily advancing, without any change of value whatever. Sinking the joint Olin winze and the Imperial is making steady progress. Preparations are being made to soon begin the development of the mine on the 1900-ft level.

**BEST & BELCHER.**—The southeast drift on the 1700-ft level is being steadily advanced without change. A joint crosscut is about being started on the south line, on the 1000-ft level, to prospect the ore vein at that point. The north drift on the 1000-ft level is being pushed ahead by the Best & Belcher to prospect their mine or that level. A joint crosscut is being started on the Best & Belcher line to crosscut the vein at that point.

**JULIA CON.**—Sinking the main incline below the 1800-ft level is making the best of progress, the bottom being still in a lively character of vein material, well filled with spots and streaks of good quartz. The face of the east crosscut from the east winze, on the 1800-ft level, is still in very favorable looking ground, showing streaks of fine quartz, which shows steady improvement as the drift advances.

**HALE & NORCROSS.**—The water has been steadily held in check during the week by the small pumps, at a point a short distance above the 2100-ft level, pending the putting in of a new pump station and pumps a little below the 2000-ft level.

**CALIFORNIA.**—The north drift on the 1600-ft level is steadily advancing, the face in very favorable ground. The east drift on this level is showing some lively quartz and excellent ore prospects. The prospecting drifts on the 1400-ft level are all being urged rapidly ahead, with more favorable prospects than for many months past.

**JUSTICE.**—What has been taken by the new management in the working of the mine remains to be seen, but it is confidently expected that ore to the amount perhaps of 200 tons per day can be extracted from the mine at a much less cost, and of a sufficiently high grade to pay not only the cost of milling, but a neat profit beside. In the meantime the developments on the lower levels are being advanced at every point, and new discoveries are being made. The main incline is making good progress and will soon be ready for the opening of a new station. The north and south winzes below the 800-ft level both continue in good ore. The south drift on this 1000-ft level is showing an improvement, and the southeast drift on the same level also shows a greater concentration of quartz and ore in the

face. The winze below the 1000-ft level continues in good ore and the south drift on the 1150-ft level is fast draining the water so that the prospecting operations can soon be extended in that direction, the ore body and vein at that point being much superior to what it is where it has been opened on the 1000-ft level.

**GRANITE.**—The work in the mine has been mostly confined during the week past to driving the southeast drift on the 1000-ft level, and the 1900-ft level, and preparing to put in the new pump lift at the 1900-ft station. The southeast drift continues in lively vein matter, east of the ore, and is now in a distance of 60 feet. Nothing is being done in the south drift from the incline at present. The change in the management will now open the way for a much more speedy development of the ore body by direct connection with the deep winze on the California line, which must greatly assist the ventilation and operating of both mines.

**BULLION.**—The south drift on the 1700-ft level is steadily advancing and has been showing an increase of quartz of a favorable character for the past two days. Sinking the combination winze to connect with the north drift on the 3000-ft level of the Imperial is making fair progress. The face of the north drift on the 2000-ft level is now in Bullion ground.

**CHOLLAR-POLOS.**—The east drift on the 1800-ft level running to connect with the Combination shaft is making the usual fair rate of progress. Sinking the Combination shaft is making the usual fair rate of progress.

**TRIMAX.**—The winze or incline being sunk below the 600-ft level is well started, being now 27 feet in depth, following the footwall of the vein and why under the vein itself. A station is cut only for the requisites bolting engine, which will be put in place by the time it is needed.

**CON. IMPERIAL.**—Sinking the south winze below the 2350-ft level is being pushed vigorously ahead and will soon reach the 2200-ft level of the Yellow Jacket, at which point it is the intention to connect the two mines for ventilating purposes.

**WARD.**—Sinking the shaft is being pushed forward with all the energy possible, the bottom being in very favorable ground. The flow of water gives little or no trouble.

**TROMAN.**—The ore resources of this mine are showing more extensive as further developed, both at the 350 and 240-ft levels. The ore body shows now 27 feet in width. The south crosscut on the 500-ft level the south cross drift is in 135 feet. The face continues in soft and very promising ledge matter.

**SUCCESS.**—Sinking the main shaft below the 900-ft level and also drifting for the ore vein at that level are both making good progress.

**ALPS.**—The erection of the new hoisting machinery is making good headway. The west crosscut on the 1150-ft level is being steadily pushed ahead to reach the ore vein on that level. The ore vein in the winze below this 1050-ft level continues of an excellent character.

**CROWS POINT.**—Daily yield 50 tons of ore, which is being crushed at the Rhode island mill as fast as extracted. The east drift on the 2000-ft level is being driven ahead at the rate of 50 feet per week. The quartz is running well, showing a slow but steady favorable improvements.

**SUTRO TUNNEL.**—The face of the header continues in easy working ledge matter, requiring constant timbering. No increase of water.

## CORNUCOPIA DISTRICT.

**DEVELOPMENTS.**—Cor. Silver State, Nov. 27: In addition to what I said of the Hussey in my last, I can now add that there is a continuous improvement in it all the time. They are now taking out all the ore which supplies the Leopold mill, and the mill is kept running all the time. Mr. Coffin returned from California day before yesterday, but has distributed no coin yet, and he appears very reticent, so no one can tell which way the Leopold intends to jump. They are keeping the usual number of men at work, which does not indicate a collapse there.

## ELY DISTRICT.

**THE CLEAR-UP.**—Pioche Record, Dec. 1: The Nevada Central train brought up on Monday, from Bullionville, \$0,000 in bullion, it being from the Alps company's mill there, and being the clean-up, as the company have moved their place of operations in milling to Condor canyon.

**ALPS & ELY.**—The work of sinking on the winze is still going on with good success and in dry ground. Prospecting is being carried on in the 1000-ft level, which looks encouraging. The other portions of the mine show encouraging prospects. Fifteen stamps of the mill will probably be started on ore on Monday, the other pans and settlers running on tailings.

**DAY JUMP.**—Everything going along nicely at this mine. Arriving the two trains along pretty fast, with indications very favorable of getting ore; in fact, have ore of a low grade in the lower tunnel.

**ALPS.**—The prospect of the Alps mine is encouraging. Quartz is coming into the face of the south drift and work is being pushed night and day. The company have taken possession of the new Condor mill and steam was gotten up yesterday. The side track and trestle from there, completed to-day, and the first train of ore will be sent to mill on Sunday, a large amount of first-class ore being on hand ready for shipment. The Superintendent says our people will see at an early day the flag unfurled at the hoisting works on the mountain, which will indicate that old Alps is again on a cash basis.

**GREAT EASTERN AND BAY STATE MINES.**—E. B. Dorsey left San Francisco on Wednesday for San Mateo, his object in going there being for the purpose of making arrangements to hire the 20-stamp mill of the Raymond & Ely company, to work the ores of the above mines. The ore from these mines average from \$45 to \$50 per ton, and, by getting them to Bullionville at a low price, they can be worked to an advantage. To get ore to Bullionville cheap from Bristol, they are proposed to make a trestle from there, by way of Stampede gap and Highland, direct to Bullionville. This will prevent the reshipping and rehandling of ore, which process is very expensive. Both the Great Eastern and Bay State mines will have the shafts in them straightened up and whims built for the purpose of taking out ore rapidly.

## EUREKA DISTRICT.

**NEW FURNACE.**—Eureka Sentinel, Dec. 2: The Eureka Consolidated company are constructing an additional furnace north of their reduction works. It will be built from plans drawn by Superintendent Donnelly, and will have some novel and interesting features never before included in smelting furnaces. Mr. Donnelly experimented some 18 months ago with a small furnace, his object being to prevent the large loss in dust that inevitably occurs in the smelting of ores as carried on at present, and demonstrated to his own and others' satisfaction that his theory was a correct one, the trial having been successful in every particular.

**BLANKET.**—The improved rotary blowers have arrived at the Eureka Con. works. One of the same kind of blowers has been in use some six weeks and gives perfect satisfaction. They will take the places of the old style blowers as soon as they can be placed in position.

The two pumps which arrived here several days ago, have been placed in position at the K. K. company's mine, and the latter are expected to arrive in a day or two, and when the four pumps are placed in position the Superintendent thinks they will keep the mine free from water.

## ROBERTS DISTRICT.

**THE MINES.**—Battle Mountain Messenger, Nov. 30: The Roberts district mines are situated 15 miles easterly from the Cortez mines, and about 35 miles southerly from Beowawe on the Central Pacific railroad. There are several mines in the district which promise well for large yields of paying ore. Gen. J. R. Williamson, of Austin, and Prof. Krom, of the Krom process notoriety, who visited the district last week, expressed themselves as highly pleased with prospects, and from what we can learn, Roberts district will soon be brought into note with the paying mines of Nevada. The ores are argilliferous and easily worked, and it is the opinion of Prof. Krom that it



## THE ENGINEER.

### The Improvement of the Mississippi.

Capt. Eads is lecturing upon a plan for the improvement of the Mississippi, which would render it navigable for large vessels as far as the mouth of the Ohio. In a recent lecture in Cincinnati, he said:

"Any system of levees which attempts to inclose these wide places in the river, will retain the fruitful cause of its own failure and entail untold cost for maintenance, because the levees are the cause of the rapid destruction of the banks, the crevasses and the cut-offs. They arrest the uniform and speedy passage of the floods to the sea, for at each one of them the current is retarded and the flood height elevated.

"I do not propose to grapple with the floods, but with the causes which produce them. Throughout the entire basin we see repeated illustrations of the fact that the greater the volume the lower the slope. Turn the waters of Red river down the Mississippi, by closing Atchafalaya, and we will increase the volume and reduce the slope. If it were reduced from the Passes to Red river only a quarter of an inch, it would lower the high-water mark nearly seven feet at Red river, and the same amount all the way up. It would then be steeper than it is for 100 miles below New Orleans. Outlets are precarious, and inevitably raise the flood line. The river should be brought to a uniformity of width, and where its volume is subdivided by islands, it should be confined to a single channel. I do not propose to shorten or straighten the river. Mature study has convinced me that no cut-offs will be needed to reduce the flood line below the level of the land. I once thought that one or two might be required. The treatment I propose is distinctly a high-water treatment. A uniformity of width of its banks will insure a uniformity of depth, and not less than 20 feet from Cairo to the sea in low water. A uniformity in width will bring a uniformity of current, which will more rapidly discharge the flood, and it will stop the caving of the banks.

"This plan is radically different from the plan of the United States Commission of Engineers. It is different in design, in the theory and in the assumption of existing conditions in the bed of the river. The Commission believes there exists in the bed of the river strata of 'hard blue clay of older formation,' which resists the action of the current 'almost like marble.' I believe the river made the bed it flows in from Cairo to the sea, and that the current can take from it and add to it with rapidity and ease wherever it is made quick or slow. The Commission does not believe there is any relation between the velocity of the current and the quantity of sediment carried in the water. I believe that every atom of sand or earth from the moment it enters the river until it is bathed by the salt waters of the Gulf, is controlled by laws as fixed and certain as those that rule the planets.

"In anticipated results these plans are immensely different. One contemplates the flood waters rising from 10 to 20 feet above the surface of the land between levees, which must involve an enormous and never-ending outlay for repairs and maintenance, with no improvement of the channel. The other, in effect, lifts above the floods forever an area equal to the States of Massachusetts, Vermont, Rhode Island, Connecticut and New Hampshire, and opens up 1,100 miles of navigation to the largest ocean shipping into the very heart of the Mississippi valley. It removes from the channel the snags that now infest it, prevents cut-offs and caving banks, and dispenses with the costly and uncertain system of levee protection, without imposing any important burden of maintenance upon the country."

Wonderful as these promises seem, there is little doubt in the minds of those who have intelligently studied the action of the currents in rivers flowing through alluvial soils, that the results mentioned can be attained and 20 feet of water carried from New Orleans to the Ohio.

### The Water Supply of London.

Now that we are talking freely of expending millions of dollars for water rights, etc., for our city, it will be in order to contrast our amounts with those required to supply London: One of the best papers read at a late meeting of the British Scientific Association, was that on the London water supply, by Messrs. Bramwell and Easton who have made a special study of the subject. In June of this year the population supplied by the eight London water companies was nearly 4,000,000, living in over half a million houses, and this at a gross expense of over \$6,000,000, yielding a net profit at a little over 6% on the capital of \$50,000,000 and over. The mere value of the property in London protected by water supply from fire is roughly estimated at \$8,000,000,000, and about a fourth of this only is covered by insurance. Small in importance as this is as compared to the other requirements of a good water supply, even the modest demands of the London fire department are not met. Although, on an average, the fires of a whole year do not consume the ordinary supply of one day for other purposes, still there should be the means of concentrating at any given point about 3,000,000 gallons in the 24 hours, or one-fortieth of the entire London supply. Manchester and Liverpool have learned

by hard experience the necessity of securing not only abundant supply of water for fire purposes, but such pressure as will give head enough to apply the water directly to fires without engine; in London not more than 40 feet can thus be got, and yet the engineers say that it must be doubled to do any real benefit.

For \$20,000,000 to \$30,000,000 it is estimated that London could be supplied with enough good drinking water to keep the population healthy, and with water under sufficient pressure for extinguishing fires. That in this respect London is economical is shown by the following figures: To protect the \$8,000,000,000 of property, there is raised and spent by the Fire Department a little less than \$500,000, and this is distributed between tax-payers, the insurance companies which pay about \$200 for each \$5,000,000 insured, and the government. Now all this makes an average of \$100 per 1,000 of its population, while Paris spends at the rate of \$250, and New York more than ten times the sum spent in London, and Chicago is not very far behind New York.

### A Novel Method of Draining a Lake.

The process of draining off a lake 200 morgen in extent by means of a bricked shaft is being watched with much interest in Ramsau. We read in a foreign exchange that the shaft is 600 meters in length, and in the form of an ellipse with a major axis of 1.85, and a minor axis of 1.08 meters, and has an incline of 1 in 1,000. From the outflow end of the shaft the water



CURIOUS RESULT OF COMPLEX GRAFTING.

will pass through some meadows by an old channel into another lake, whence it finds a natural exit. The ordinary methods of conducting away water in the district are by open canals or by drain pipes, but a shaft was chosen in this instance as being the more economical procedure, independent of its other advantages. The line of direction runs under a ridge of high ground 27½ meters above the level of the base of the shaft. The cost of carrying off the water by drain-pipes was estimated at 126,000 marks (£6,300). The shaft on the other hand, inclusive of bricks, labor, lime, cement, etc., cost only 25 marks per meter run, or 15,000 marks (£750) in all, to which is added a sum of 2,000 marks for the traveling expenses and services of an official inspector. As each meter of earth is cut out by the hewers, the brickwork of the shaft is pushed forward by workmen in waiting at the rate of from one and a half to two and a half meters per day. About 170 meters are now built, and the completion of the shaft may be expected about June next. Besides its moderate initial cost, the method of drainage by shaft has the recommendation of great durability, works of a similar nature in Silesia having required no repairs whatever for a period of more than 50 years. No land whatever is lost either temporarily or permanently in constructing the shaft, as would be the case if drainage pipes or an open cutting were employed, and the 200 morgen of rich land reclaimed by the undertaking will richly repay its comparatively trifling cost.

TRANSCONTINENTAL SURVEY.—The Hagerstown (Md.) Mail says that Mr. Edwin Smith, of the United States coast-survey service, detailed to make a survey of levels from the

Atlantic to the Pacific, has commenced operations, making the court-house, Hagerstown, the initial point of his survey. It was the original design to follow up the National turnpike in this survey, and it was with this view that Hagerstown was selected as the base of operations; but owing to the hilly character of the country this route was changed, and Mr. Smith has determined to run his line to Williamsport, and thence along the tow-path of the canal to Cumberland. This division of his work he expects to finish this winter, and then he will carry it on to Cincinnati, St. Louis, and westward by the Kansas Pacific railway. On its completion to San Francisco it is designed to return to the initial point and then to the Atlantic, either by the way of Harrisburg and Philadelphia to tide-water, or by the way of Harper's Ferry to Washington. The work will involve several years' labor.

### Steam Cultivation.

The telegraph announces that Congressman Horace Davis, of San Francisco, has introduced a bill at Washington allowing the importation of tackle, etc., for steam cultivation free of duties for the coming two years. Although we have no fuller information of Mr. Davis' measure other than the mere statement of the above fact, we imagine that the removal of duty will be advocated on the ground that experiment of steam cultivation is one very desirable to make

most desirable. It would induce new strength in our soil and new spirit in our cultivators, and would be just the stimulus which our producers need now that new fields in India and elsewhere are being brought into competition with them in the production of breadstuffs.

As the subject is up for discussion we have taken from this week's receipts of English exchanges two paragraphs; one giving the experience of a practical farmer from his own work, and the other the general deduction of an agricultural writer from a wider range of experience. A Bedfordshire farmer, in a letter to the London Times, says: "Within a distance of four miles from where I am writing, there were six sets of Fowler's double-engine tackle at work on Wednesday. Neither is it necessary for farms to increase in size, in order that industry, capital and steam may be applied to the land. I myself occupy barely 300 acres, and yet I have the pleasure of seeing the rubbish torn from the ground by the steam cultivators. I entered upon the farm, which had been much neglected, two years ago, and but for steam I know not what I should have done."

The advantages of steam work when the soil is too hard and dry for horse plowing commend themselves most forcibly to our farmers. We quote from the *Agricultural Economist* concerning the present season in England: "The possessors of steam tackle have certainly had a good time of it, while many farmers have had to submit to the annoyance of seeing their horses idle so far as the breaking of land was concerned. We do not remember an autumn which has been so favorable for clearing land, where the power has been equal to the work. An owner of one of Howard's farmer's engines and tackle told us the other day that nothing could have given him greater satisfaction than the work he had been able to accomplish this season, while all around him his neighbors had been compelled to suspend plowing because of the dry, hard condition of the soil. Nothing can prove such a practical argument in favor of steam power properly applied as a walk over a farm under steam cultivation at this time. Steam has enabled farmers to take time by the forelock, and to utilize the hard, dry weather by breaking stubbles and going on with all necessary operations, and thus doing away with all grass and weeds; while farms under the ordinary plow are only partially and imperfectly cleared, and must remain an eyesore to the occupiers until the spring is far advanced."

Is not this a deduction from experience with steam plowing which is of sharp application to our general conditions? It would give us the mastery of the soil at a season when there is abundant time to work it, and it would leave it in such condition that the earliest of the fall rains could sink deep and deposit themselves for the future needs of the plant. Under conditions which do not favor dry sowing, the advantage would be almost as great, for if the soil were thoroughly stirred beforehand, a very slight cultivation would prepare the seed bed for later sowing. The advantage of plowing the summer-fallow, even in spite of the difficulty with which it is now accomplished, is generally recognized. It would be directly productive of profit, then, if the engines, when not driving the threshers, could be kept employed in working the fallow as well as plowing for direct seeding.

We hope that a thorough and careful test of steam cultivating machinery will be made, both in its effect upon soils which have been long cropped under the old system, and in the matter of comparative expense of doing the work and other matters relating thereto. We should not pass untried progressive ideas which are demonstrating their value elsewhere.

### A Peculiar Graft.

Quite a curiosity in grafting may be seen on Mr. Lewelling's place in Alameda county. By studying the engraving on this page the complications of these grafts may be seen. This graft blends into one tree five varieties of the apple. The four base stocks were originally four independent trees, standing at the angles of a square, about four feet apart. The tops of these were inclined to each other, and united in a complex graft, after which interlacing branches were united by graft at each point of contact, forming, as it were, a perfect framework for an aboriginal wigwam. Upon the top, at the apex of this growing structure, another graft was set, which has grown to be a large bearing tree.

This skillful warping of nature was executed 15 years ago, by Mr. J. Lewelling, and is, perhaps, the most perfect specimen of complex grafting on this coast. It is quite a curiosity.—*Pacific Rural Press*.

ELIXIR EUCALYPTUS.—The following formula has been recommended, for which we are indebted to *New Remedies*:

Eucalypts leaves.....	4 troy oz.
Alcohol, 85%.....	q. s.
Oil or orange.....	2 drachms.
Oil cinnamon (Ceylon).....	2 drachms.
Sugar.....	12 ounces.

Reduce the eucalypts leaves to a coarse powder, add the oils to 1½ pints of alcohol, moisten the leaves with a portion of this menstruum, and pack it in a percolating funnel. Pour on the remainder of the alcohol and percolate 1½ pints of tincture, using, if necessary, an additional quantity of 85% alcohol. Add the sugar to the mixture and make the product measure two pints by adding more alcohol.



Continued from Page 354

Newville, the farthest north, Elk Creek and Leesville, the last at the head of Bear valley—all centers of the local trade of their respective vicinities.

This is the region of mineral springs—sign boards may be seen pointing to Bartlett's, Cook's, Anderson's, and others.

#### The Wilbur Hot Sulphur Springs,

Being but a short drive from the lower end of Bear valley, a taste of this water and the luxury of a bath were soon enjoyed. They are within about 25 miles from the terminus of the Northern railroad at Williams, and have been a resort for invalids for the past 17 years. An analysis of the waters shows that they contain both sulphuretted and muriate of potash, soda, iron, alumina, together with sulphuric and muriatic acid, so that they have become celebrated, in particular, for the cure of some of the worst cases of rheumatism and dropsy. They are found excellent for salt rheum, tetter, and all other cutaneous diseases, and said to seldom fail in giving relief to those suffering from neuralgia, liver complaint, dyspepsia, and numerous other kindred diseases. The temperature of the principal spring is 145° Fahrenheit, although there are four other kinds of water, including one spring of sulphur and iron (cold), and one of cold soft water. The air is pure, the surroundings delightful, and all things about the establishment, inclusive of mud bath for rheumatic patients, have been carefully fitted up by Mr. Brame, the accommodating proprietor, both for the convenience and comfort of his guests. A visit to the springs is one among the many pleasant reminiscences connected with our wanderings around the county. K.

#### "Expensive Plodding."

EDITORS PRESS:—An article under the above head, in your issue of November 24th, favors, a discussion and looks to the State University as a desirable teacher to practical millmen, to-wit: The proper drop for stamps in quartz-mills.

Now, education is to be desired and respected at all times, but there are different kinds and different methods of obtaining it.

It does not reflect in the least upon the learned man who has followed a thorough course of preparatory book knowledge by practical experience in metallurgy, to say that in some details he has no advantage over workers who are life students in their business.

There is a class of men to-day that have worked thousands of tons of ore of varying qualities in numerous differing mills.

Some of these men may or may not have started to earn their bread with only a common school education, but are untiring students of their business, well read and thoroughly informed of progress in their line. They are not to be compared with such petrified disciples of the antiquated methods of the old world, as the previous article refers to.

It is they who have quickened the speed of stamps, and it is in their knowledge that the amount of drop for a fast stamp is proscribed because of time for fall.

One of them would not run a mill 24 hours without knowing whether the battery was working with economy.

These are the men from whom mill builders must take their cue, the experience of one supported by the mechanical abilities of the other. Thus has milling been made what it is to-day.

Let the State University make experiments; the results would receive all credit due, but it would be like a flouring miller teaching a man who had ground a handful of wheat in a coffee-mill.

A discussion might enlighten or bewilder some who lacked enterprising experience.

M. P. B.

**WORK AND PLAY.**—Dr. John Strachan, of Edinburgh, has recently published a valuable little treatise, physiologically inquiring into the bearing of play upon education and training; and after some preliminary remarks he proceeds to state that the law of spontaneous development through play does not end with physical improvement, but that, after a time the higher and more differentiated faculties come to be required for the perfection of the animal, and that the same law presides over their evolution. Play, he explains, that is apparently aimless, or, at least, not consciously directed exercise, is the means of securing the equable development of the brain and its faculties—memory, imagination, hope, wonder, and even special kinds of intellectual and moral activity, according to the endowments, and perhaps also the accidents of social position in the individual. "Exercise is accompanied by pleasure up to the limit of fatigue; beyond this limit, by pain or uneasiness. Special endowments or faculties brought into prominence by accident and after exercised are more, others are less, developed. But in every case there is a limit, and the only sure way of ascertaining the limit is by giving scope to the instinct; in other words, by allowing 'play' or apparently unregulated spontaneous impulse its due place in the work of education."

The money spent in our late election would pay the salaries of all those elected. Moral—draw it yourself.

## USEFUL INFORMATION.

### The Electric Light and Its Cost.

Nature announces that a special division of the Paris International Exhibition will be devoted to electricity, so that all the systems of electric lighting may be tested comparatively. The electric light continues to create the greatest interest in Paris. The experiments which we mentioned some time ago have been conducted during 40 consecutive days at the Lyons railway station. A force of about 40 horse-power is sufficient to keep going 28 electric lamps, each of which gives a light equal to 80 gas lamps, and works with regularity for 10½ hours. The effect is splendid, the whole of this station, except the waiting room, being lighted a *giorno*. The question of economy, however, is not yet settled. It is not known whether the company will agree to pay a somewhat higher price in order to multiply the power of its illumination. These experiments have been tried on Lontain's system, a modification of Wilde's and Siemens' principle. M. Lontain has contrived to send the current generated by an ordinary Wilde's machine into an electro-magnetic engine called a distributor. The central part being strongly magnetized by the current from a Wilde's machine, a number of electro-magnets are influenced by its rapid rotation, and in each of these an induction-current is generated. These induction-currents are powerful enough to feed three electric lamps, and as there are two series of 12 magnets a single machine could, theoretically, feed 72 lamps. Actually, however, it feeds only 28. Lontain uses a new regulator, which works very well by the dilatation of a small silver wire. By its dilatation this part of the apparatus works a lever system, and brings the carbon electrodes into contact. The French Northern railway has purchased a number of Gramme magneto-electric machines. They intend to use them at their terminus goods and stores.

The New York Tribune, looking toward the application of the electric light in this country, says: It appears to be difficult to arrive at the cost of using the electric light, figures of estimate in different experiments varying considerably. In many manufacturing establishments the cost of the power to drive a magneto-electric machine would scarcely be felt, as only two or three horse-power, at the most, would be required. The cost of the carbons is said to be less than five cents per hour per lamp, on the Jablohoff plan; another estimate is about twice as much, but perhaps refers to two lamps instead of one. An electric light which does not, according to accounts, appear to be constructed on the Jablohoff plan, tested in practical service at LaChapelle, France, costs, including motive power for the machine, about 12 cents per lamp per hour. Machines capable of running three lamps, cost less than \$500, and perhaps that sum could be made to cover all the first outlay. The wear and tear of the machine is not estimated. A careful study of the figures thus far furnished, leads to the belief that light can be furnished by electricity, in France, at about two-fifths the cost of gas; and as the price of gas in most American cities exceeds the price in Europe, it seems probable that a similar estimate of the comparative cost of electric illumination for this country would fairly apply.

### Treaty about Trade Marks.

A treaty has just been signed, says the *Iron Age*, by Mr. Pierrepont, our Minister to England, and the Earl of Derby, giving mutual protection to citizens in both countries against the pirating of trade marks. Each nation has its own stringent law applicable to its own people, but these statutes have done little to stop the mischief so long as they have no effect on foreign offenders. Our trade mark law, of Congress last year, makes punishable the imitation of trade marks, or dealing in trade mark goods, or selling or keeping empty packages bearing trade marks with intent to defraud. This law puts a stop to this vilest of the tricks in trade. The treaty just signed gives the same security in England. Under this convention it will only be necessary for Americans and Englishmen to register their trade marks in each other's country, paying the small fees required, and they will have all the protection which any law can give them. The operation of the treaty will be doubly beneficial to Americans, guarding consumers here against impositions from the sale of spurious products with counterfeited British trade marks, and preventing the sale of bogus American goods in British markets, by which the reputation of our manufactures and our export business are damaged. The adoption of this treaty should lead to similar agreements between the United States and other countries where these commercial villainies are tolerated.

**IMPROVED CARMINE INK.**—The *English Mechanic* says: The solubility of carmine lake in caustic aqua ammonia is attended with this disadvantage: that in consequence of the alkaline properties of ammonia, the cochineal pigment will, in time, form a basic compound, which in contact with a steel pen no longer produces the intense red, but rather a blackish color. To avoid this evil, prepare the ink as follows: Saturate 1 gramme of pure carmine with 15 grammes of acetate of ammonia solution and an equal quantity of distilled water in a porcelain mortar, and allow the whole to stand for some

time. In this way a portion of the alumina which is combined with the carmine dye, is taken up by the acetic acid of the ammonia salt, and separates as precipitate, while the pure pigment of the cochineal remains dissolved in half saturated ammonia. It is now filtered, and a few drops of pure white syrup added to thicken it. In this way an excellent red drawing ink is obtained, which holds its color for a long time. A solution of gum arabic cannot be employed to thicken this ink, as it still contains some acetic acid, which would coagulate the bassorine which is one of the natural constituents of gum arabic.

**PATENT BUSINESS OF THE WORLD.**—The following abstract in the London *Mining Journal*, prepared from the official records, shows the remarkable increase of patent business in the principal countries of the world during the past 30 years. The figures first in order for each country refer to the patents granted in year 1846, and the second figures refer to the year 1876:—Great Britain, 493, 3,435; Canada, 38, 1,252; Austria, 406 (in 1853), 1,294; Baden, 9, 187; Bavaria, 112, 217; Belgium, averaged, 400, 2,657; France, 2,750, 5,734; Italy, 224 (in 1855), 538; Prussia, 55, 461; Saxony, 31, 483; Sweden and Norway, 58, 293; United States of America, 619, 17,026; Wurtemberg, 8, 256. Russian patent business has been almost stationary during the 30 years, the official list in no case having been more than 100 patents. Thus the total patents in the above countries for the years first quoted were 5,303, as against 33,938 in the year 1876. It may be explained, however, that the 33,938 patents do not represent an equal number of inventions, as many of the better class of inventions are patented in several countries simultaneously.

**CAUSE OF MILL FIRES.**—A correspondent of the London (England) *Mirror* writes as follows concerning fires in flour mills: "I have been for more than 30 years connected with the trade, and in that time it has been my misfortune to be once burned out of a situation. I have also seen and know many mill fires, the majority of which have taken place in the night, and most of those after the mills have shut down several hours, many of them breaking out of a Sunday morning, and even as late as the evening, or after midnight—in other words, on Monday morning. The cause of the long interval I attribute to the smoldering of dust around some hot bearing till it has assumed a body of fire and charred wood, when a slight draught has produced a flame, and before being noticed was spread too far to be stopped till the mill and its contents have been reduced to a heap of ruins. In most cases this might have been prevented by it being made the duty of one man to go round and look to all bearings before locking up the place for the night."

**A COLD YEAR.**—As a cold year in California means a wet year, readers will be glad to know that Prof. Piazza Smith, by observations of the waves of temperature for the past forty years, predicts that the coming winter will be more than usually cold, to be followed by a remarkably warm period, beginning about the middle of 1879.

## GOOD HEALTH.

### Poison Oak and Its Antidotes.

EDITORS PRESS:—As most of us know, "poison oak" is the cause of a vast deal of misery and suffering in California. There is scarcely ever a time, in any little town or neighborhood, when there are not one or more persons suffering from it, and it has been estimated that there are in this State near 3,000 persons constantly afflicted with the cutaneous disease caused by this dreaded scourge.

Many and various have been the "remedies" with which our local practitioners have endeavored to combat the effects of the universally dreaded poison oak. When I mention a few, such as lotions and ointments of lead, bismuth and opium compounds, applications of hartshorn and various alkaline salts in every variety of combination, it will be seen that not only is this scourge of wide prevalence, but of deep practical interest to the physician and pharmacist, for every medical practitioner meets with more or less cases of it in his daily rounds.

The many remedies which have been used for counteracting the effects of poison oak all give way in efficiency and celerity to the *Grindelia robusta*. This, like the *Rhus toxicodendron*, is indigenous to the State and found in many parts, but grows most luxuriantly in the foothills of the Sierra Nevada and Coast Range of mountains.

*Grindelia robusta* is a tall, stout perennial, belongs to the Composite family, and looks like a small sunflower. It is from one to three feet in height, and has bright yellow flowers in beads, one or two inches in diameter, flowering from June to October. Before flowering the unexpanded heads or petals secrete a quantity of resinous matter, white and sticky, like balsam, that is finally, after the flower expands, distributed like varnish over the petals of the flower. The whole plant, at this season, flow-

ers and leaves, is resinous and viscid. When it grows in dry hills it is stiff and rigid with narrow thin leaves; but in damp localities it is more robust and succulent, with wide fleshy leaves. May and June are the months in which the *Grindelia* should be gathered for use, as at that time the plant abounds most in the balsamic and resinous juice in which its medicinal properties reside, and causes its marvelous effect in the cure of this eruption from oak poisoning, for which purpose it has been used with good effect since the occupation of the country by the Americans.

Dr. C. A. Canfield (deceased), of Monterey, Cal., was the first to call the attention of the medical profession to the therapeutic action of *Grindelia robusta* in cases of "poison oak."

I have experimented in different ways to obtain a "fluid extract" which should fully represent the medicinal virtues of the leaves and flowering tops of the plant. The fluid extract, which is the most concentrated form of preparation used, contains in one pint the strength of 16 troy ounces of the drug, and is made by the following process: A sufficient quantity of the carefully picked leaves and tops of the *Grindelia* are put into a suitable vessel and nearly covered with a mixture of one part of water to two of alcohol, allowed to macerate for 24 hours, a strong cover being laid over and pressed down with appropriate weights. At the expiration of this time the whole is transferred to a percolator with a stop cock attached; and after remaining for five or six hours, the resulting liquid is drawn off and the residue in the percolator taken, transferred to strong bags, and submitted to the action of a powerful press. The liquid from this is now mixed with that from the percolator and set aside. It is generally requisite to repeat the process with one half the amount of menstruum, and the results being mixed together should measure one pint for every 16 troy ounces of the drug employed. In case, however, the full measure is not obtained, enough alcohol is added to supply the deficiency, and the whole rapidly filtered and transferred to well-stoppered bottles. This process gives a clear, thin, nice-looking fluid extract, with a pleasant odor and characteristic aromatic taste, and which can be kept for a long time with usual precautions without any deposit. It may be presumed that the medicinal virtues of the *Grindelia robusta* reside in the viscid and resinous juice before mentioned. Confirmatory evidence offers itself in the fact that the plants gathered from the lower and marshy grounds are more robust and succulent, the leaves and stalks larger and coarser in appearance and devoid almost entirely of the "balsam" before mentioned, and has little efficacy in the eruption of poison oak. The directions are as follows:

For poison oak eruption, the best method is to mix one or two teaspoonfuls of the strong fluid extract of *Grindelia* with half a tumbler of cold or tepid water, and apply freely with a sponge or cloths dipped in the mixture to the parts affected. One or two applications will often suffice for a cure, but if the disease has been of long duration, several days may elapse before entire relief is obtained. In severe cases of poisoning, cloths dipped in the solution may be bound upon the parts, and, if necessary, more of the fluid extract added. The most obstinate case of poisoning will be overcome by this mode of treatment, and immediately after the first application the most surprising relief is experienced. JAMES G. STEELE.

San Francisco, September, 1877.

**TATTOOING A CONTAGIOUS DISEASE.**—One of the most curious cases of spreading a disease of offensive and contagious character has lately been brought to light by Dr. Maury, of the Philadelphia hospital. The *Polytechnic Review* says: Attention was attracted to the case some time ago by the large number of persons who were admitted to the hospital suffering from this disease, and who had been inoculated with it through the process of tattooing. Shortly thereafter it was ascertained that at Reading, Pa., some 200 or 300 persons had been similarly inoculated, and that it was the work of a notorious vagabond, who practiced tattooing as a trade. Through the efforts of the police authorities this person was shortly thereafter arrested at the instance of the health officers of the two cities. Medical examination revealed the fact that he was afflicted with the disease, and it transpired that in performing the operation of tattooing, he was in the habit of moistening his needles, before charging with paint, by placing them in his mouth, which was filled with sores.

**EATING ORANGES.**—A vast number of oranges are eaten by the Spaniards, it being no uncommon thing for the children of a family to consume ten or a dozen oranges each before breakfast, gathering them from the orange groves, where they hang like the veritable golden fruit, which they are metaphorically supposed to be. Such wholesale consumption of what we look upon as a luxury appears to have no ill effect. The testimony of a late eminent physician authorizes the use of fruit as most wholesome immediately upon waking in the morning; he in fact, prescribed such a regimen to a friend as the only invigorating and permanent cure for indigestion, facetiously remarking that he gave her a piece of advice which, if it were known to his dyspeptic patients, would cost him his practice, as they might prefer so simple a remedy to his professional visits.—*London Gardeners' Chronicle*.



# MINING SCIENTIFIC PRESS

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SAN FRANCISCO:

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## The Week.

The event of the week in mining circles has been the change in control of several of the largest mines on the Comstock. Ophir and Mexican have both passed into the control of Flood & O'Brien, and that firm now own about a mile in one piece on the ledge besides what they own on the south end. They now control Hale & Norcross, Savage, Gould & Curry, Best & Belcher, Consolidated Virginia, California, Ophir and Mexican, aggregating 4,930 feet, divided into 1,721,600 shares. The value of these properties on Wednesday, in the aggregate, were \$43,012,800. Jas. G. Fair now superintends these properties, the larger portion of the properties being owned by the bonanza firm.

In the Justice mine also a change has been made. The new trustees are E. J. Baldwin, Archie Borland, R. H. Lloyd, A. K. P. Harmon and C. L. Weller. Samuel Curtis, late of the Ophir mine, was nominated for Superintendent, in place of E. A. Schultz. This action was opposed by Messrs. Harmon and Weller, who were prominent officers of the Ophir company at the time of Mr. Curtis' dismissal from that mine. It was contended by the other members that Mr. Curtis possessed a knowledge of mining that made him a valuable acquisition, and it was the intention of the Board to do away with the loose manner of conducting business common to the mining companies, by which the superintendents are given power to make contracts and handle the property of the companies at the mines without proper supervision of the directors. It was stated that the intention of the new Board was to advertise for all proposals for supplies, etc., make the awards, and discharge their duties fully and as economically as possible. Mr. Curtis was thereupon elected Superintendent, notwithstanding the opposition of Messrs. Harmon and Weller, and resulted in the two last named gentlemen handing in their resignations as members of the Board.

## Profits of Mining.

The various mines listed on the San Francisco Stock Board have in the aggregate, levied assessments amounting to \$55,578,103 and have paid dividends amounting to \$110,044,199. It will be noticed that the dividends are almost double the assessments and yet some people say mining does not pay. Mining in stocks does not always pay by a good deal, but mining in mines is a different thing altogether. It must be remembered, also, that many of the mines listed on the board were never expected to pay or intended for anything else than means of levying assessments or disposing of stock. Everybody who has ever had anything much to do with the stock market understand why this class of mines exist and knows also that if they had not been taken into account the assessments would have shown a much smaller figure, although the dividends would not have been increased.

Moreover, it must be recollected that these are only an extremely small proportion of the many mines on this coast, and of those not listed on the boards very little is known as far as yield is concerned. There are hundreds of mines in every direction which are paying well, which make no showing in the above figures. For instance, we mention elsewhere in this issue the fact of the Idaho mine of Grass Valley, paying its one hundredth dividend this month, but it is a private corporation and the stock is not dealt in on the boards.

When one comes to think of it the figures given above show results which are not to be found in many kinds of business. A return of 100% on such large amounts is seldom found. The mines in question are mainly located in Nevada, very few California mines being enrolled on the boards. In fact the California mines on the boards are so few that of the total amounts they have only levied \$1,094,100 in assessments and paid \$2,583,500 in dividends. Washoe leads the list with \$100,020,700 dividends and \$44,808,182 in assessments; White Pine assessed us \$1,550,561, and only returned \$31,999; Ely district levied assessments amounting to \$2,031,000 and paid a return of \$4,432,500; Tuscarora and Cornucopia levied \$388,000 in assessments, for which they have only so far returned \$262,500; miscellaneous Nevada mines have levied \$2,380,250 in assessments, and returned for this expenditure \$2,135,000 in dividends. Idaho mines treated their investors badly, having drawn out in the form of assessments \$3,426,000 and returned as dividends only \$575,000. In the last case, however, it was no doubt more the fault of the management than of the mines.

It is well to call the attention of the public to facts like these occasionally, so that they will appreciate the value of the mining interests of the country in proportion to their value.

## The Legislature of 1877-8.

On Monday the members of the two houses of the California Legislature of 1877-8 assembled at the Capitol in Sacramento and effected a preliminary organization. On Tuesday the final steps were taken and the Legislature declared ready for business. The Senate elected Hon. E. J. Lewis, of Tehama, President *pro tem.*, Rufus Shoemaker, of Nevada, Secretary; P. H. Dunn and Geo. Seckle, Assistant Secretaries; Wm. H. Bell, Sergeant-at-Arms, S. S. Ford, Assistant Sergeant-at-Arms; Newton Benedict, Minute Clerk; George Corbie, Journal Clerk; George W. Greene, Enrolling Clerk; Michael Mitchell, Engrossing Clerk; A. L. Edwards, Jr., Postmaster.

The Assembly elected Hon. C. P. Berry, of Sutter county, Speaker, who made an appropriate speech upon taking the chair. Hon. J. E. Murphy, of Del Norte, was chosen Speaker *pro tem.*; Robert Page, Chief Clerk. As we go to press the minds of the legislators are occupied with the choice of a U. S. Senator.

The following is a complete list of the members of the Legislature and the districts they represent. All readers should preserve it for reference, as we propose to make frequent allusions to the topics brought before the law-making bodies this winter:

## Senators.

The (\*) asterisk signifies that the Senator is a hold over—all the others are newly elected:  
First District—San Diego and San Bernardino—J. W. Satterwhite, D.\*  
Second District—Los Angeles—George H. Smith, D.  
Third District—Ventura, Santa Barbara and San Luis Obispo—P. W. Murphy, D.  
Fourth District—Fresno, Tulare, Kern, Mono and Inyo—Thomas Fowler, D.  
Fifth District—Mariposa, Merced and Stanislaus—John M. Montgomery, D.\*  
Sixth District—Monterey, San Benito and Santa Cruz—Thomas Flint, R.\*  
Seventh District—Santa Clara—W. Z. Angney, D.\*; D. E. Murphy, D.  
Eighth District—San Francisco and San Mateo—Geo. H. Rogers, D.\*  
Ninth District—San Francisco—T. McCarthy, D.\*; J. C. Murphy, D.  
Tenth District—San Francisco—J. Craig, D.\*; Peter Dean, R.  
Eleventh District—San Francisco—E. Nunn, D.\*; J. S. Eoyott, D.  
Twelfth District—San Francisco—William M. Pierson, D.\*; J. J. Donovan, D.\*  
Thirteenth District—San Francisco—Frank McCoppin, D.\*; Robert Howe, D.\*  
Fourteenth District—Alameda—James Beazell, D.\*; Nathan Porter, R.  
Fifteenth District—Contra Costa and Marin—Paul Shirley, D.\*

Sixteenth District—San Joaquin and Amador—George S. Evans, R.\*; Frank M. Brown, R.  
Seventeenth District—Calaveras and Tuolumne—W. M. Gwin, Jr., D.  
Eighteenth District—Sacramento—Creed Haymond, I.\*; N. Greene Curtis, D.  
Nineteenth District—Solano and Yolo—S. G. Hilborn, R.\*; John Lambert, D.  
Twentieth District—Napa, Lake and Sonoma—Wm. McPherson Hill, D.\*  
Twenty-first District—Sonoma—A. P. Whitney, R.  
Twenty-second District—Placer—W. C. Norton, R.  
Twenty-third District—El Dorado and Alpine—Wm. H. Brown, R.  
Twenty-fourth District—Sierra and Nevada—Niles Scales, D.\*; John C. Coleman, D.  
Twenty-fifth District—Yuba and Sutter—Jesse O. Goodwin, R.  
Twenty-sixth District—Butte, Plumas and Lassen—W. H. Crane, R.  
Twenty-seventh District—Del Norte, Humboldt and Mendocino—R. McCarvey, D.\*  
Twenty-eighth District—Siskiyou, Modoc, Trinity and Shasta—Daniel Ream, D.  
Twenty-ninth District—Colusa and Tehama—E. J. Lewis, D.\*

## Assemblage.

Alameda—J. E. Farnum, R.; R. H. McClure, R.; M. W. Dixon, D.  
Amador—Thomas Dunlap, D.; Robert Ludgate, D.  
Butte—Gilbert H. Neally, D.; M. Brooks, R.  
Contra Costa—Albert J. Young, D.  
Calaveras—A. R. Wheat, D.  
Colusa and Tehama—T. J. Hart, D.  
Del Norte—J. E. Murphy, D.  
El Dorado—J. H. Miller, R.  
El Dorado and Alpine—S. A. Nott, D.  
Fresno—R. P. Mace, D.  
Humboldt—Joseph Russ, R.  
Inyo and Mono—S. P. Moffat, D.  
Los Angeles—Asa Ellis, D.; J. B. Holloway, D.  
Lake—S. K. Welch, Ind.  
Mariposa and Merced—Andrew Ewing, D.  
Marin—Charles D. Allen, R.  
Mendocino—L. F. Long, D.  
Monterey—C. S. Abbott, R.  
Napa—J. M. Mayfield, D.  
Nevada—G. W. Glenn, D.; M. Garver, D.; S. L. Blackwell, D.  
Placer—M. C. Wilson, R.  
Plumas and Lassen—J. H. Whitlock, R.  
San Francisco—Ninth District—J. V. Coffey, D.; M. C. Conroy, R.; A. J. Griffith, D.; C. H. Gough, D. Tenth District—W. B. May, R.; R. W. Murphy, R.; S. B. Blake, R.; G. Barstow, D. Eleventh District—W. F. Anderson, D.; J. A. Hicks, D.; J. E. Connolly, D.; J. Haworth, D. Twelfth District—W. Broderick, D.; C. G. Gildea, D.; J. J. Thoin, D.; W. Amussen, D. Thirteenth District—J. F. Swift, I. R.; S. W. Backus, R.; W. K. Forsyth, R.; J. H. Dhiniane, D.  
Sacramento—Joseph Routier, R.; Grove L. Johnson, R.; Reuben Kercheval, R.  
San Diego—Fred N. Pauly, R.  
San Bernardino—Byron Waters, D.  
San Luis Obispo—L. M. Warden, D.  
Santa Barbara and Ventura—Caleb Sherman, D.  
Santa Clara—Rush McConas, R.; Wm. Hanns, D.; C. W. Upton, D.  
Santa Cruz—George Paes, D.  
San Benito—James F. Breen, R.  
San Joaquin—R. C. Sargent, R.; G. Myers, R.; R. B. Thompson, D.  
San Mateo—J. P. Ames, R.  
Sierra—Lewis Rixington, D.  
Siskiyou and Modoc—P. C. Robertson, D.  
Stanislaus—C. Dorsey, D.  
Solano—R. C. Haile, D.; John T. Dare, D.  
Sonoma—R. F. Tuttle, D.; E. C. Hinshaw, D.; C. H. Cooley, R.  
Sutter—C. P. Berry, D.  
Trinity and Shasta—J. C. Montague, D.  
Tulare and Kern—W. S. Adams, D.  
Tuolumne—Edward Smyth, D.  
Yolo—W. M. Dewitt, D.  
Yuba—R. P. Hugg, D.; D. A. Ostrom, D.

## Recapitulation.

SENATE.	
Democrats.....	28
Republicans.....	11
Independent.....	1
* ASSEMBLY.	
Democrats.....	54
Republicans.....	24
Independent Republican.....	1
Independent.....	1
JOINT BALLOT.	
Democrats.....	82
Republicans.....	35
Independents.....	3
Total.....	120

## Patent Your Mines.

The importance of patenting the mines cannot be too frequently impressed on the mining community. Every man who finds a ledge looks forward with bright hopes to its future, and is assured that success will reward his labors. When it does it seems too bad to have a defective title prevent a sale. A United States patent is a guarantee that no one can come in with a conflicting title after the patent is granted; and people will not buy mines now-a-days unless they are sure of this. The avoidance of litigation with mining property is worth looking after, and when the title is once vested in the proper owner by means of a patent, that is the end of any legal proceedings.

A doubt regarding ownership is a worse thing to contend with in negotiating for mining property than a doubt as to the value of the mine itself. When a man buys a mine he is not compelled to spend more than he wants to and can stop when he likes; but in a law suit he is not a free agent. Therefore, if miners intend selling their claims or getting capitalists to aid them the first step after getting the claim is to get the patent. Moreover, by procuring a patent the miner is released from annual expenditure, and the cost of the patent is no more than a few years' necessary annual expenditure. Once the mine is patented it can lie idle until the owner is ready to work it, as the title then rests in him and no longer on the Government.

Much trouble and expense can be prevented by getting a patent and it is much less expense than many suppose. The proprietors of this journal have made arrangements by which they take charge of the application and the whole business of obtaining a patent for mining ground, with no trouble to the applicant and at very moderate expense. Any information on the subject will be cheerfully given on application.

## Labor Rights and Wrongs.

The events of Thanksgiving Day in this city proved that the laboring men had learned a lesson which will be of infinite benefit to them. The fact was that at least 7,500 of them paraded the streets of the city with their bands of music, and banners flying; afterward assembled around a speakers' stand and listened to speeches delivered in their interest, and, finally, went to their homes without disturbing the public peace, thus proving their respect for the law and their conformity to constituted authority. By thus conducting themselves they can claim for themselves the respectful attention of their fellow citizens, and however one may disagree with them as to the wisdom and justice of their claims, all will agree in regarding them as true men and good citizens. To them belongs, of course, the right of public assemblage and honest discussion of wrongs either true or fancied. Theirs is the privilege of protest and petition. Theirs is the ballot to use it honestly as they may. Theirs is the opportunity to present their views for public consideration and to win the support of those to whom the views commend themselves. As all these rights were exercised or insisted upon in an orderly manner, the so-called workmen's organizations lift themselves from the mire of a mob, into which their leaders at one time seemed disposed to drag them, and they become lawful assemblages entitled to respect and protection. We are glad for the sake of the laboring men that such has been the character of their demonstration. It promises well for the true solution of questions which vex them, questions which, while they were accompanied by threats of violence and tumult, could not be considered for a moment by law-abiding citizens.

There are certain things which the laboring men can do, and certain things which they cannot do. They desire a greater share of this world's goods. They cannot secure it by any wild communistic scheme for division of property. It may be that there have been large fortunes built up dishonestly. No arm but that of the law can lay hand upon them. They are of rare occurrence. By far the greater part of those men who have accumulated property have done it by those practices of self-denial, enterprise and industry which are the only royal avenues to competence. What a man has accumulated in this way, no one else has any more right to touch than he has to pull the hair from his head. It is his own by every right, human and divine. It is the result of the consumption of tired muscles and weary brain. You may pursue the same course as he but have no right to lay hold upon his garments nor clog his steps. But though there can be no tolerance for this wild and fanatical idea, which is put forth in the name of labor and yet has not an element of labor in it, there are doubtless reforms which are needed and which, when secured, will remove the barriers which make the course to comfort and competence harder to some classes than to others. These reforms it is plainly in the scope and design of the law to secure. And these it is wise to discuss, to vote for and to impress upon the attention of law makers.

We think the laboring men will find that they have the sympathy of all well disposed citizens in their honest efforts to better their condition and to improve themselves. But they must be wise and patient. Some of the things they cry loudest for are among the impossibilities, so far as immediate and general accomplishment are concerned. It is quite right that they should be awake and enterprising to secure for themselves the profitable labor men have to dispense, but they must guard against assuming the role of dictators. Sweeping changes are always dangerous to industries and men will not make them. As it now appears it is simply impossible to carry on some productive enterprises at the wages which the available white laborers demand. At the present low rates the enterprises just maintain themselves. The disposition is good enough on the part of many employers of labor, but their business will not yield enough to meet any higher wages than they are now paying.

However this may be, and whatever desirable reforms the working men may be able to secure by their organization, they must all remember one thing and that is that no amount of organization can take the place of individual industry and devotion to the plain work of making a living. They may send men from their own ranks to occupy seats in the future legislatures at Sacramento; they may secure the city officers to a certain extent, but this will not lift from any of them the need of personal and persistent labor. There are few men who escape labor and they generally lose the good opinion of their fellow men with it. Whatever a society may do, it still leaves the individual member to carve out his own fortune; and our caution, to those who may be expecting great things as the result of their combination, is that the measure of success which they meet in obtaining for themselves the profitable labor of this coast will depend not so much upon the order to which they belong as to their individual devotion to their employer's interests, and the fidelity with which they stand by him in time of need and assist him in his extremity. Men who have thus served others have come to rule empires, and thus only can they rise.



## HYDRAULIC MINING IN CALIFORNIA.\*

No. 9

(By ARD. J. BOWIE, JR., A. B., Mining Engineer.)

## Blasting.

Where the ground is very hard, recourse is had to blasting. For this purpose a small powder-drift is run in on the bottom from the face of the bank a given distance, proportionate to the ground to be blasted. From the end of the straight drift a cross drift forming a T is driven. For example, in hard cement like that at Smartsville, with an 80-foot bank, in a case where the ground is ordinarily bound, a drift is run in at the bottom of the bank, say 85 feet long. At the end of it cross drifts are run out respectively 45 feet in length. Forty feet from the face of the bank two similar cross drifts are also driven. From the ends and center of each cross drift two small "lifters," as they are called, are driven at right angles, extending respectively half way between the cross drifts and the face of the bank. These places are then filled with powder, which, in such ground as is in that locality, would require from 450 to 500 kegs.

The heads of several of the kegs being removed, the main drift, is stamped, and the powder is exploded by means of an electric battery or fuse.

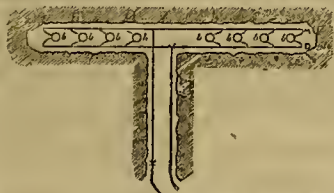
Occasionally in large blasts several cross drifts are required, and in such cases it is customary to fire the powder simultaneously in several different places by electricity. The quantity of powder used is determined by the position, character, and height of the bank, a sufficient quantity only being taken to shatter it.

In some places with lighter material two or three hundred kegs of powder will easily do the work that 500 or 600 barely accomplishes in heavy cement. At Blue Point a blast of 2,000 kegs was exploded. At the Enterprise mine, 250-foot banks, a blast of 1,700 kegs was fired. The powder is of the ordinary blasting quality. For destroying large pieces of lava, pipe-clay, boulders, stumps of trees, giant powder cartridges are found very efficient.

It is customary in certain districts to wash off the top or lighter gravel, and subsequently blast the bottom cement. For this purpose shafts 15 to 20 feet deep, as may be demanded, are sunk, and a small chamber is excavated in the bottom of them. The chamber is charged with five or six kegs of powder, tamped, and then exploded by electricity. Undoubtedly there is a great waste of powder in bank blasting, and the subject is worthy of investigation, with a view to future improvement in this particular. In blasting it is desirable to thoroughly shatter the material, i. e., separating rock and cement, so as to facilitate its washing, thus insuring the earliest separation of the gold, by enabling the hulk of the precious metal to come in immediate contact with the quicksilver in the head of the sluices, and affording every opportunity for the most complete scouring, and securing of the eroded gold particles.

The following method of bank blasting has been found to give excellent results with banks from 50 to 125 feet high, such as are generally encountered in hydraulic mining, and likewise in cement gravel of ordinary tenacity. In the absence of more definite knowledge on the subject, its adoption can be recommended.

The main drift should be run in a distance two-thirds the height of the bank to be blasted. The cross-drifts from the end of the main drift



Sketch of a Drift Showing the Arrangement of the Wires for Exploding a Blast.

should be driven parallel with the face of the bank, and their lengths determined by the extent of the ground which is to be blasted. A single T is all that is necessary. The amount of powder required for charging the drift is from one-half to two-thirds of a keg of powder, minimum quantity, per 1,000 cubic feet of ground covered by the drifts—i. e., height of bank  $\times$  length of cross-drifts  $\times$  length of main drift = cubic contents. The quantity of powder used must depend on and vary with the position of the bank and character of the gravel.

Late experiments made with Judson powder, applied as above directed, has given good results, and, though not definitely determined, the indications at present are that the use of this new explosive will be a great saving in the costs of bank blasting.

The shattering effects of powder used in the manner and proportion already described have been roughly estimated from the appearance of the ground subsequently washed at from 225 to 230 cubic feet of ground shattered per pound of powder exploded.

\* A paper read before the American Institute of Mining Engineers of the Wilkes-Barre meeting, May, 1877.

† Ordinary black blasting powder, 25 pounds per keg.

‡ The quantity of powder is increased when the banks are strongly bound, or when the gravel is exceedingly tough.

§ Experiments made with blasts of 250 to 400 kegs of powder.

Apropos of tamping, one of the attendant costs of bank blasting, it may be well to remark that as yet, with the present explosives employed, all experience in bank blasting proves that, with a strong tamping, the best results are obtained. With 150, 250 and 350-foot banks a different method of blasting is adopted. The main drift in such cases is driven in from the face of the bank 45 to 50 feet in length. The cross-drifts are run parallel with the face of the bank, and their length determined by the ground to be moved.

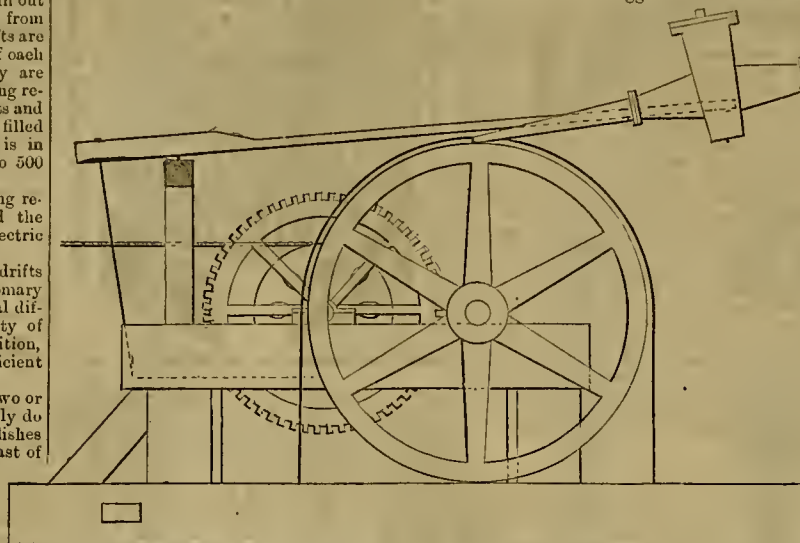
In charging these drifts the amount of powder used should be sufficient to blow out the bottom ground (the line of least resistance), the bank the falling by its own weight. The firing of all blasts is best done by electricity, and

wheel is attached, and, using 30 inches of water, it lifts stones weighing 11 tons. The guys are held by double capstans.

The derrick is not taken down when moved. It can be readily moved 100 feet in 10 hours.

## Academy of Sciences.

The regular meeting of the California Academy of Sciences was held on Monday evening last, Dr. Gibbons in the chair. Rock specimens were presented to the society, showing glacial action, in one of which was imbedded a portion of bone. The society also received from Mr. Winslow, I. Howard's collection recently from Arizona. Dr. Kellogg described a new species

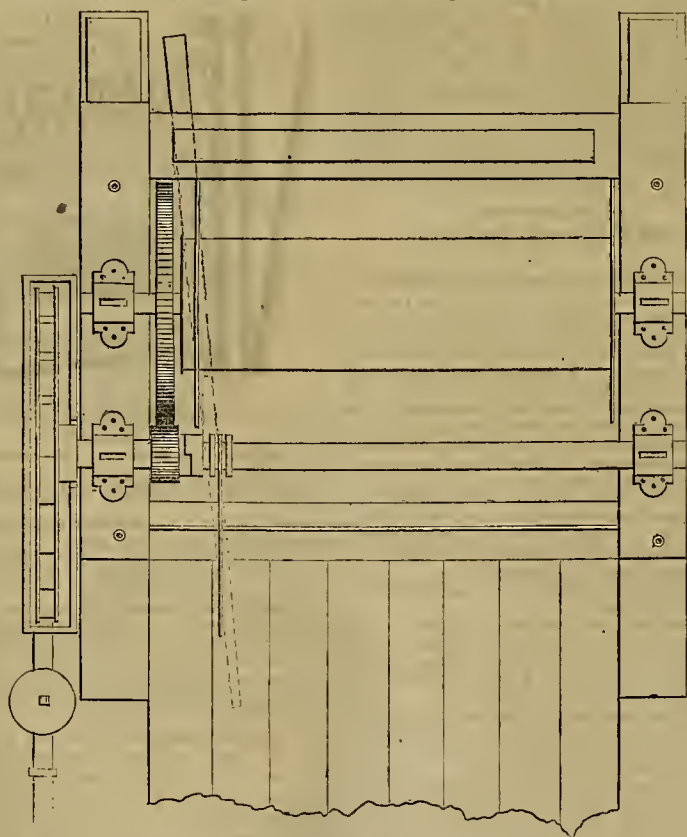


Section of Hoisting Machine with Hurdy Gurdy Wheel. Used in Hydraulic Claim attached to Derricks for Handling Boulders.

where the dynamite exploders with platinum wires are used the compound circuit is most desirable.

The powder in boxes or kegs is piled up in rows in the drift. Two wires, A A and D D, extending along the middle row, the tops of the boxes on which the wires rest being removed.

of "hog peanut" vine named *Amphicarpaea arizonica*. A paper by Prof. John Leconte, President of the University of California, on "Mars and his Moons," was read by S. B. Christie. Mr. Lorquin spoke about the society being represented by some of its collections at the Paris exposition. The subject was referred



GROUND PLAN OF HOISTING MACHINE.

The exploders, b b b, are inserted in Giant powder cartridges and placed on top of the paper covering the powder. (The Judson powder comes covered with strong paper to exclude moisture.) The wires, A A and D D, are then connected with the wires, Y Y and X X (as shown in sketch), which extend to the battery.

## Derricks.

In working hydraulic claims, boulders are frequently encountered that cannot be removed by hand. To facilitate their removal a strong derrick is used. The bedrock derrick now in use has a mast 100 feet high, and a boom 92 feet long. The whole is set in a cast-iron box placed on sills. It is held in position by six guys of galvanized iron wire rope one and one-eighth inches in diameter. A whiplock with three-quarter inch diameter steel rope is used for the hoisting tackle. A 12-foot diameter hurdy-gurdy

to the council, with a request that action be taken. Mr. Hollister presented to the society a specimen of the Japanese persimmon, grown in Mr. Hollister's orchard at Santa Barbara. In Japan, it is said, as many varieties are grown as of the apple here, and the sweetness of the fruit is always retained.

The Idaho mine, of Grass Valley, paid, on Monday, its one hundredth, or centennial dividend, the amount being \$15,500. The mine commenced paying dividends in 1869, and has paid regular monthly dividends to this time, the aggregate amount being \$2,270,820. Beside the payment of these dividends the mine has paid for the erection of costly hoisting works, a 35-stamp mill, and a fire-proof brick building for the pumping engines, air compressors, and all the improved apparatus used in mining.

## The President's Message.

On Monday the regular session of Congress began at Washington, and President Hayes transmitted his message upon public affairs. The document is quite long and for the benefit of those who have not leisure to peruse it in *extenso*, we prepare the following summary of the points made. After alluding to the general peace and prosperity of the past year, the President proceeds to consider the situation in the Southern States. He declares that the withdrawal of troops from the South and throwing the management of affairs upon the State authorities have resulted in the disappearance of turmoil and turbulence, induced an improvement in public credit, a revival in commerce and a hope of general prosperity.

On the financial question the President is pronounced against measures which interfere with the resumption of specie payments in 1879. He finds several strong reasons for opposing the making legal tender of silver coin, but approves a new silver coinage which shall make it practically equal in value with gold, so that an equilibrium can be maintained and both metals retained in circulation in their appropriate spheres of common use.

On civil service reform the President declares his belief in the appointment of men to office on the special ground of fitness and the retention of officers for long periods in offices which require special acquirements and qualifications. He thinks that the Civil Service Commission appointed by Grant should be recalled to devise proper rules for the service.

On the subject of foreign relations the President states that the recognition of the Diaz government in Mexico has been delayed by the outrages upon our frontier at the hands of Mexicans. Congress is urged to take measures to protect our citizens against further trouble on the border. Concerning the application of the Samoan islands for a protectorate the President says their claims shall be carefully considered.

In allusion to the report of the Secretary of the Treasury, the following is a statement of the National book-keeping: The revenues of the Government during the fiscal year ending June 30th, 1877, were \$269,000,586.62. The total expenditures for the same period were \$228,660,008.93; leaving a surplus revenue of \$30,340,577.69. This has substantially supplied the requirements of the sinking fund for that year. The estimated revenues of the current fiscal year are \$265,500,000, and the estimated expenditures for the same period are \$232,430,643.72. If these estimates prove to be correct there will be a surplus revenue of \$33,069,356.28—an amount nearly sufficient for the sinking fund for that year. The estimated revenues for the next fiscal year are \$269,250,000.

The President recommends the increase of the army to one-third more than its present numbers. On the Indian question the message is on the side of fair dealing and encouragement of the natives in the art of civilization.

On the subject of timber lands and the new desert land law we quote the President's words as follows: "I invite the attention of Congress to the importance of the statements and suggestions by the Secretary of the Interior concerning the depredations committed upon the timber lands of the United States, and the necessity for the preservation of forests. It is believed that measures taken in pursuance of existing laws to arrest the depredations will be entirely successful if Congress, by an appropriation for that purpose, renders their continued enforcement possible. The experience of other nations teaches us that a country cannot be stripped of its forests with impunity, and we shall expose ourselves to the gravest consequences unless the wasteful and improvident manner in which the forests of the United States are destroyed be effectually checked. I earnestly recommend that the measures suggested by the Secretary of the Interior for the suppression of depredations on the public timber lands of the United States, for the selling of timber from the public lands, and for the preservation of forests, be embodied in a law, and that, considering the urgent necessity of enabling the people of certain States and Territories to purchase lumber from the public lands in a legal manner, which at present they cannot do, such a law be passed without avoidable delay.

On the subject of desert lands the President thinks something should be done to induce their reclamation and thinks they might be leased for long terms to parties for stock growing.

**BULLION SHIPMENTS.**—Since our last issue shipments of bullion from the prominent mines have been as follows: Con. Virginia, Nov. 27th, \$204,744.32; California, Nov. 27th, \$328,604.26; Tybo Con., 24th, \$4,123.84; Northern Belle, 26th, \$4,706.03; Standard, 26th, \$32,706.74; Grand Prize, Dec. 1st, \$17,400; Martin White, Nov. 29th, \$19,100; Manhattan, 28th, \$7,841.10; Tybo Con., 27th, \$7,933; Endowment, Dec. 1st, \$2,197; Con. Virginia, Nov. 27th, \$202,304.25; California, 27th, \$232,682.22; Northern Belle, 28th, \$4,741.55; Northern Belle, Dec. 1st, \$5,987.70; Tybo Con., Nov. 30th, \$4,080.65; Grand Prize, Dec. 5th, \$22,600.



## California State Finances.

It is probable that we cannot make better use of a part of a column than by showing forth the facts of the financial condition of our State as they are laid down in the report of the Controller, Hon. W. B. C. Brown, which has just been submitted to the Governor. These facts are frequently alluded to by our correspondents and they should be in the minds of all citizens. From tabular statements of receipts into the treasury it is seen that the receipts were: Twenty-seventh fiscal year, 1875-6, \$3,651,895.39; twenty-eighth fiscal year, 1876-7, \$4,549,258.30; total, \$8,201,153.69.

Expenditures: Twenty-seventh fiscal year, 1875-6, \$3,961,964.18; twenty-eighth fiscal year, 1876-7, \$3,785,111.35; total, \$7,747,075.53; excess of receipts over expenditures, \$454,078.16.

The amount reported by the Controller to the Superintendent of Public Instruction, subject to apportionment for the support of common schools, from Feb. 24th, 1875, to and including Feb. 1st, 1877, was \$2,792,688.43. The amount apportioned for each scholar was \$7.68 for the year ending Feb. 22d 1876, and \$7.98 for the year ending Feb. 21st, 1877. The whole amount distributed during those two years, was \$2,792,204.10, leaving a balance in the school fund, Feb. 21st, 1877, unapportioned, of \$484.33.

The amount of bonds now held in trust by the State Treasurer for the University fund yield an annual income of \$50,040. The total amount drawn from the State Treasury for support, aid, and endowment of the State University and for the support of the State University Library, during the twenty-seventh fiscal year, was \$92,690.88; of which the sum of \$50,040 was derived from interest on bonds, and \$42,652 from other sources; while the total amount drawn for the twenty-eighth fiscal year was simply the interest on bonds, amounting to \$50,040.

The total funded debt of the State on June 30th, 1877 was \$3,411,000.

Of the cost of assessing and collecting State taxes the Controller says: The percentage paid for assessing, auditing, collecting, keeping and paying in State taxes was a little more than 5.8% of the gross amount of property tax collected for the twenty-seventh fiscal year, and a little more than 5.5% for the twenty-eighth fiscal year. This percentage added to the above percentage of delinquency shows that the entire percentage of delinquency and for assessing, auditing, collecting, keeping and paying in State taxes for the twenty-seventh fiscal year was about 16%, and for the twenty-eighth fiscal year a little more than 11%. To secure greater economy in this branch of the service the Controller thinks that compensation to county officers, for auditing, assessing, collecting, keeping and disbursing State taxes or other moneys, should be abolished, save in the case of the County Treasurers, who should be allowed their mileage for bringing the State money to the State Treasury.

The rate of taxation for the twenty-seventh fiscal year (1875-6) was 60.5 cents, and for the twenty-eighth fiscal year (1876-7) was 73.5 cents on each \$100 valuation of property. The means necessary to defray these expenses will have to be made by the Controller.

The total amount of the estimate for the two fiscal years to come is \$5,715,784.15, of which \$2,757,939.15 will be required for the thirtieth fiscal year; and \$2,957,845 for the thirty-first fiscal year.

## India Rubber Plants.

Since an "India rubber tree," has been described as growing well in Sacramento (and, if we are not mistaken, plants yielding an elastic gum have been introduced in other parts of the State), there has been quite an interest awakened among those who are on the *qui vive* to test all possible products. Nor has this interest been confined to our State. It has excited tree growers in the old cotton States, and the Department at Washington has been besieged for plants. Superintendent Saunders, in his report to the Commissioner of Agriculture, expresses disbelief that the India rubber plant can be successfully grown anywhere in this country, because they are of strictly tropical character. Notwithstanding this apparent damper upon zeal in this direction, Mr. Saunders gives an enumeration of the leading India rubber plants which all readers will be pleased to possess. We take the following points from his report: "In the East Indies rubber is collected from *Ureola elastica*; from several species, of *Ficus*, mainly from *Ficus elastica*; and from a few other species, natives of the East Indies and western tropical Africa. South American rubber is also extracted from plants of different genera. The best is said to be obtained from the *Hevea brasiliensis*, a native of the Para forests, considered to be distinct from the *Stiponia elastica*, which furnishes the largest portion of the rubber entering into the commerce of that country. The sand-box tree, *Hura crepitans*, yields a milky juice which is similarly converted into caoutchouc by evaporation. These plants belong to the natural order *Euphorbiaceae* a large family of plants, mostly yielding a milky juice, containing acid and poison-

ous properties. Mexican rubber is extracted from a native tree, the *Castilloa elastica*, which grows abundantly near the Gulf coast. This plant is botanically allied to the rubber-producing *Ficus* of the East Indies. A new elastic gum has recently been produced in Mexico, which is said to be derived from a native herbaceous plant allied to the family of asters. This plant would probably succeed in the Southern States. These are strictly tropical trees, for which we have no suitable climate; but attention might probably be directed to the gum-producing Mesquite tree of Texas, *Algarobia glandulosa*, which yields a non-elastic gum of the nature and possessing all the essential qualities of gum-arabic.

**A NEW SAFETY DYNAMITE.**—An improved nitro-glycerine compound, says *Seward's Journal*, has been invented by Mr. Gustaf Fahnebjelm, of Stockholm, the chief modification being that the second main ingredient is charcoal produced from a special wood, and selected and prepared in such manner as to be able to absorb and solidify the greatest possible quantity of nitro-glycerine. In order to render the combustion more complete, and to augment the rapidity of the explosion, a small quantity of nitrate of potash or other suitable salt, is added to the mixture of the two ingredients above named. The composition of the new sebastin depends upon the objects for which it is to be used, and the effects intended to be produced. The strongest compound, and even in this there is stated to be no risk of the separation of the nitro-glycerine, is composed of 78 parts by weight of nitro-glycerine, 14 of wood charcoal, and eight of nitrate of potash; and when less power is required the proportions are varied, the second quality consisting of 68% by weight of nitro-glycerine, 20 of charcoal, and 12 of nitrate of potash.

**THE NERVELESS MORTAL.**—A perfectly impassive, emotionless man or woman is a rarity; still, such do exist, and we hardly know whether to regard them as objects of envy or pity. Those without emotion, those who do not suffer at times from over-sensitiveness or excitement, are like rocks or trees; the winds of adversity may blow, a deluge of affliction may cover them; they remain calm and happy, the sleep is sound, the appetite unimpaired. Such are certainly enviable conditions, but the law of compensation is not annulled for the benefit of these favored ones. Wherever we find them, we may be sure that we meet those devoid of the finer and more delicate instinct of human nature,—those who are incapable of enjoying the beautiful things in the natural world or in art. They suffer less in the journey of life, but they also enjoy less. Like animated statues they live, without strong friendship or affections, without pity, without generosity; and nerveless they die, with scarcely a pang. The world regards them with suspicion during life, and refuses to weep when they pass away. It is for wise reasons that but few of this class are permitted to make their advent into the world.

## The Free Labor Exchange.

We have received the following circular of the Free Labor Exchange, which we publish for the benefit of all whom it may concern:

The Free Labor Exchange established by voluntary donations, is now open for business, and the co-operation of every employer throughout the State of California and the Pacific coast is earnestly and respectfully requested. Its object is to provide work for the needy, and distribute to the best advantage the large and surplus number of laborers and mechanics now gathering in San Francisco.

The advantages offered by the Labor Exchange are furnished without any charge whatever, being absolutely free to all, and the management will take especial care in the selection of competent and reliable employees.

FARMS will be supplied with skilled and unskilled husbandmen.

HOTELS can be furnished with good cooks, waiters, servants, chambermaids and clerks.

FACTORIES will have their help forwarded according to orders, from a laboring man to a skilled engineer and superintendent.

SAWMILLS and lumber camps may order their sawyers, loggers, edgers, planers, screw-turners, choppers (by cord or contract) and others.

MINES can order their drillers, timberers, blasters, time-keepers, engineers, laborers, etc.

FEMALE servants of any description or nationality will be carefully selected at short notice, for the city or country, on receipt of the necessary traveling expenses, as customary for female help only.

All employers residing in the country are requested to be particular in sending their orders, and to mention the exact duties required of employees, the wages offered, the route it is desirable for them to take to reach their destination; and in order to prevent disappointment and useless expense, it is hoped that ample time will be allowed to select and forward help. Any information about the supply and price of labor will be furnished at any time by this Exchange.

Apply or address all communications of follows, viz.: THE FREE LABOR EXCHANGE, P. O. box 2,173, Nos. 33 and 35 O'Farrell street, (near Market, between Dupont and Stockton street,) San Francisco, Cal.

WOODWARD'S GARDENS has the following new attractions: The buffalo chase; large white skeleton; new museum; improvements in the zoological department, besides the other features which have made it popular.

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DEWEY & CO., Patent Solicitors.  
San Francisco, 1877.



Among the advantages gained by this holder are the following:

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EVERY new subscriber who does not receive the paper and every old subscriber not credited on the label within two weeks after paying for this paper, should write personally to the publishers without delay, to secure proper credit. This is necessary to protect us and the subscribers against the acts and mistakes of others.

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## TAXES.

## TAXES.

1877-1878.

Notice is hereby given, that a certified copy of the Assessment Book of the Taxable Property of the City and County of San Francisco, Real Estate and Personal Property (Subsequent Assessment Book included), for the Fiscal Year 1877-78, has this day been received; that the State, City and County TAXES for said fiscal year are now due and payable at the office of the undersigned, Room No. 1, City Hall, and the Laws in regard to their collection will be strictly enforced.

Taxes will become delinquent on the FIRST MONDAY in January, 1878, and unless paid prior thereto, Five per cent. will be added to the amount thereof.

WM. FORD,

Tax Collector of the City and County of San Francisco.

SAN FRANCISCO, October 22, 1877.

## Montgomery Avenue Tax.

Notice is hereby given that a certified copy of the Assessment Book of Real Estate, which is subject to Assessment to defray expenses incurred by the opening of Montgomery Avenue, has this day been placed in my hands to collect Taxes thereon.

Said taxes are for the Fiscal Year 1877-78, and are now due and payable at the office of the undersigned, Room No. 1, City Hall. All Taxes remaining unpaid on the FIRST MONDAY of January, 1878, will have Five per cent. added thereto.

WM. FORD,

Tax Collector for the City and County of San Francisco.

SAN FRANCISCO, October 22, 1877.

## ASSESSMENT OF LANDS

## Benefited by Widening Dupont St.

Notice is hereby given, that a certified copy of the Assessment Book of the Real Estate which is subject for the payment of Principal and Interest upon "Dupont-Street Bonds," as directed by an Act of the Legislature of California to authorize the Widening of Dupont Street in the City of San Francisco, "Approved March 23, A. D. 1876," has this day been placed in my hands for collection. The Laws in regard to the collection of the same will be strictly enforced.

WM. FORD,

Tax Collector of the City and County of San Francisco.

SAN FRANCISCO, October 22, 1877.

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Before purchasing an American Watch, examine the different styles manufactured by the HAMPDEN WATCH COMPANY, at Springfield, Mass. They are the latest and best improved manufacture. You can depend upon them for fine finish, durability and perfect time. They are sold at favorable prices—in tact, no higher than many of the inferior styles. Examine into the merits of this Watch before you buy any other. Our word for it, you will not regret it.

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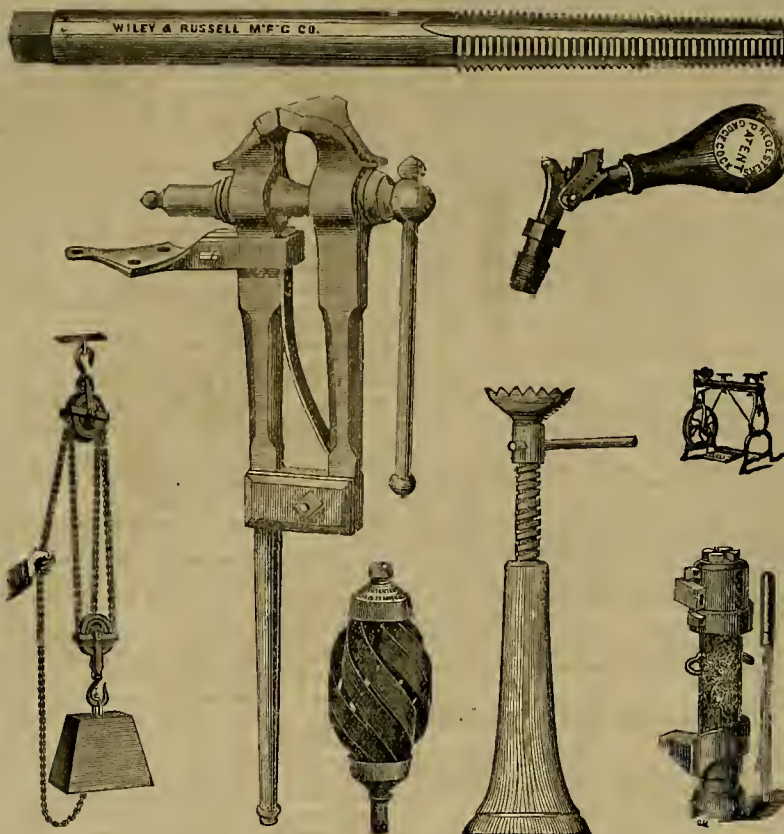
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For a small amount, in several claims on one of the

**RICHEST LEDGES IN ARIZONA.**

Money needed for development. The ore will pay a handsome margin to ship to the city. Apply at this office.



Continued from Page 357.

is a good place for capital to invest. The mines are easy of access, with plenty of wood and water.

### Arizona.

**LIBE.**—*Arizona Sentinel*, Nov. 28: E. E. Chilson has gone to California for supplies. He tells us that he bought the Buckeye, in Globe district, for \$5,000, after selling the Buena Vista for \$7,500. He says the Miami mine has turned out over 300 tons of ore, from a vein now five feet wide, that goes \$200 to \$300 per ton. Townsend's mill was to have started up this week. The road from the mill to the Miami was all finished except a short elbow close to the mine.

**PROSPECT DISTRICT.**—*Arizona Citizen*, Nov. 28: A party just in from the Pioneer country informs us that the boys out there are going way down on several of their "way up" mines with most encouraging results. The "Connelly boys" are not doing much work just at present, their rich strike has paid them so well that they have concluded they can afford to take a little rest.

The Copper Top and the Yankee veins, are extensions of the Silver Queen and are the best developments in that section. Our informant says there is a large body of mineral in sight, and he has seen chunks of ore taken out that assay from \$150 to \$1,000 per ton. There are two veins of mineral and the shafts are down on each from 10 to 15 feet. The Silver Queen shows considerable copper while the ore in the extensions is a gray carbonate. This was mentioned as a peculiar fact.

The Wheeler claim, on the same belt, has a 16-foot shaft, and the ore assays from \$200 to \$1,400 per ton, also a gray carbonate. The Silver Bell is looking first rate. An incline has been run on this claim, and is now down between 40 and 50 feet. The vein is from 15 to 20 feet wide, and carries handsome free milling ore.

**McMILLAN CAMP.**—As to the mines, they have never looked so promising as now. The McMillan company are taking out the regular amount of pure silver, about \$100,000 per month. The Little Mac is only second to the McMillan. The Gen. Lee company have started work, and with a force of six men at present, (in the opinion of your correspondent), will, in 30 days from date, be numbered with the paying mines of McMillan camp. Their line is only 20 feet from where the McMillan company have lately struck a six-inch vein of solid chloride ore worth \$8 to \$10 per pound. There are a number of good prospects here, and no time to investigate as yet, but will keep you posted. One other prospect (pretty good one) lays about half way between Ramboz camp and the Champion mine. This is Bixby's. At present a force of eight men are taking out about 10 tons daily that will average \$1,000 per ton. How is that for a prospect?

### Dakota.

**GOLDEN TERRA.**—*Black Hills Pioneer*, Nov. 25: This mine is one of the bonanzas of the Hills. A breast of ore some 20 feet in width is being worked, and several shafts and tunnels have been sunk and run into the hill, all proving the mine to be a mass of gold-bearing quartz. That portion owned by C. D. Arms, together with the mill machinery, has been sold to Gilmer, Salisbury & Hurst, for \$83,000 in cash, possession to be given in a few days. The mill is a Carter's patent process, and when in good running order will crush a ton of ore every hour. A cleanup, made from a six days' run, resulted in 720 ounces of gold bullion. The 500 feet on the east side of the gulch is owned by J. W. Bailey, and has a 10-stamp mill in operation. This mine is worked more systematically than the other, and good ore is obtained in every direction.

**FOREST CITY.**—This place is being built up slowly but surely. The Spearfish and Bear Creek ditch is being rapidly pushed toward completion. It is being excavated from both sides, employing 15 Chinamen and but 30 white people.

**GOLDEN STAR.**—This mine is now owned by Yerxa & Stone. The shaft is down 138 feet, following the vein, which is now about three and one-half feet in width, the ore prospecting very highly, and showing free gold. About eight tons have been extracted. The lucky owners have been offered a 10-stamp mill for a half interest in the mine, but refused.

**NUMBER 1** above discovery on Deadwood, is being worked day and night, and is yielding good pay. It is the design of the owners to work all winter, and dump for spring sluicing.

**NUMBERS 7 and 8** below discovery on Deadwood, owned by Walters & Burrill, are being worked from the surface to bedrock, and good pay obtained.

**NUMBER 9** below discovery on Deadwood is now owned by Seeland, Tibbets & Watts, who purchased it from John McAleer, who took out a large sum of money last season. The present proprietors are reworking the gravel, which pays good wages. The unworked ground pays richly.

**NUMBER 3** above discovery on Deadwood is being worked by a day shift only. It is 23 feet to bedrock. This claim paid \$50 to the set of timbers last week.

**LEUELLA.**—The debris has been removed from the cave, showing a large quantity of ore that came down with the gangue. About 20 tons of good paying quartz are daily extracted from this large cut.

**GUSTIN.**—A large quantity of ore has been broken down at the mouth of the tunnel, exposing a body of ore, larger than was expected. The quantity taken from the side of the tunnel has increased its width to about 25 feet. The daily yield is about 35 tons.

**NUMBERS 17 and 18** below on Deadwood have suspended work until Monday next on account of the difficulty with the bedrock drain.

**THE Davenport 10-stamp mill.** C. H. Enos, Superintendent. This mill, at Lead City, Nov. 17th, cleaned up 824 ounces of gold, worth \$10.50 per ounce, from a four days' run on ore from the Homestake No. 1. The amount crushed was 70 tons.

**CALM No. 10** below discovery is owned by Messrs. Buckley & Co. and is one of the best on Deadwood creek. Last season the owners took \$40,000 from a breast of earth less than 20x50. At this point the bedrock pitches into a basin, from which \$2,000 were taken in one shift of eight hours. Mr. Buckley informed our reporter that at present the claim is not yielding very large returns, on account of the smoothness of the bedrock.

### Idaho.

**Mining Notes.**—Owyhee *Avananche*, Dec. 1: At the Golden Chariot work has been progressing for the past few weeks under very favorable auspices. The shaft has been sunk to the 1500-ft level and to a depth of about 25 feet beyond that point. The workmen will commence some time next week on the crosscut.

At the Black Jack mine, on Florida mountain, the force has been busily engaged on the hoisting works, which are now going rapidly forward to completion.

A. J. Sams has a force of about 15 men at work on the Illinois Central. They are taking out some good rock. The Eagle mine will probably be resumed on the War Eagle mine in a short time. Mr. Oberdorfer, the recent purchaser of the property, will probably employ a small force of men during the winter.

**Porot.**—Although the recent crushing of Porot's rock did not turn out as well as was expected, the parties who have always had faith in the prospects of this mine express the belief that abundance of rock can be taken out during the winter, which will yield from \$40 to \$70 to the ton.

**ELMA.**—A. S. Thompson and brother are running a tunnel in their mine, the Elma, which is on the Empire side of War Eagle mountain.

**EMPIRE.**—Matters at the Empire remain *statu quo*. We learn from Mr. Crane, who is here representing the company's interests, that work will probably be resumed next week.

### New Mexico.

**THE LEGAL TENDER.**—*New Mexican Herald*, Nov. 24: We took occasion, last Monday, to walk up to and climb down into the Legal Tender mine, located on the northern slope of Tunnel hill. Numerous piles of graded ores

obstructed the pathway, and, upon the summit of the hill, a rough pile of unassorted ore, thrown out in a circular ridge, indicated the main shaft. The Legal Tender is the original discovery which led to the building of the town of Silver City. Shortly after the influx of miners set in, the Chloride district was discovered, and as everybody felt disposed to grasp at the richest thing in sight, work upon this lead was abandoned. Within the past week, Messrs. Weeks & Yankee, who have secured all the other interests, came to the conclusion to push work on the mine and the result shows that they were wise in their determination. There are three shafts now sunk—one of 30 feet, one 45 feet and one 50 feet. From the bottom of the 30-ft shaft a drift of 50 feet has been run in an easterly direction along a well-defined vein of ore, which assays 50 ounces to the ton. The 45-ft shaft has a drift of about 80 feet, following a large body of ore, which inclines to the westward. At the end of the latter shaft an extensive deposit of ore has been struck, the face of which would indicate a vein running north and south. At the other end of the drift is found another large body of ore, bearing to the east. The 50-ft shaft follows a vein of ore 18 inches in width, running in a southeasterly direction. This is evidently the main vein and the average assay is \$250 to the ton. Here is where Messrs. Weeks & Yankee are now pushing their work, and the quality of ore exposed shows that they have done well to turn their attention to this particular part of the mine. The other veins show a width of from two to three feet; but, as we have said, this ore does not return over 50 ounces. We brought down a few fine specimens from the first-class dump pile. Experts here say they will run from \$500 to \$800.

### New Incorporations.

The following companies have filed certificates of incorporations in the County Clerk's office, at San Francisco: COPPIN M. Co., Dec. 1st. Location: Lyon county, Nev. Capital stock, \$100,000. Directors—Tod Robinson, J. B. McGee, C. H. Maddox, E. M. Hall and A. J. Blair.

FISG M. Co., Dec. 3d. Location: Esmeralda county, Nev. Capital stock, \$100,000. Directors—Alvin Potter, E. P. Figg, F. H. McCormick, W. B. Graue and Thos. Cole.

AMERICAN BORACIC ACID Co., Dec. 3d. Capital stock, \$2,500,000. Object: To manufacture and sell borax and other chemicals. Directors—L. W. Coo, A. W. Preston, A. L. Day, R. W. Van Brunt and P. H. Krauer.

MANZANITA CON. GRAVEL M. Co., Dec. 4th. Location: California. Capital stock, \$500,000. Directors—T. J. Owens, J. M. Fulwiler, W. Thorpe, D. C. Jones and F. Vessault.

MONTANA AND CALIFORNIA M. Co., Dec. 4th. Capital stock, \$5,000,000. Directors—J. Weil, M. Wasserman, L. Weil, H. A. Waterman and F. Frankenthal.

## PATENTS AND INVENTIONS.

### List of U. S. Patents Issued to Pacific Coast Inventors.

(FROM OFFICIAL REPORTS FOR THE MINING AND SCIENTIFIC PRESS, DEWEY & CO., PUBLISHERS AND U. S. AND FOREIGN PATENT AGENTS.)

By Special Dispatch from Washington, D. C.

WEEK ENDING NOVEMBER 20TH.

PRODUCTION OF WOODEN BOTTLE-STOPPERS AND BUNGS.—Frank A. Howitz, S. F.

WASHING MACHINES.—Ives Scoville and Pliny Bartlett, Oakland, Cal.

HYDRAULIC AND WIRE-ROPE PUMPING SYSTEM.—William P. Barclay, Virginia City, Nev.

GEOGRAPHICAL CLOCKS.—William A. Cates, Union, Ogn.

WRENCH.—Calvin H. Crowell, Stockton, Cal.

SAW HANDLER.—James N. Dudley and John Anderson, Petrolia, Cal.

WINDMILL.—Henry C. Fallin, Grangeville, Cal.

DEVICE FOR TILTING CHAIRS.—Thomas A. Fitzsimons, Benicia, Cal.

CHILL MOLDS FOR WHEELS.—George eArthur, San Leandro, Cal.

SIGX.—Joseph Perkins, S. F.

TRADE-MARKS.

WHISKY.—More, Reynolds & Co., S. F.

WHITE LEAD.—Whittier, Fuller & Co., S. F.

The patents are not ready for delivery by the Patent Office until some 14 days after the date of issue.

NOTE.—Copies of U. S. and Foreign Patents furnished by Dewey & Co. in the shortest time possible (by telegraph or otherwise) at the lowest rates. All patent business for Pacific coast inventors transacted with care and in the shortest possible time.

### Notices of Recent Patents.

Among the patents recently obtained through Dewey & Co.'s SCIENTIFIC PRESS American and Foreign Patent Agency, the following are worthy of mention:

**IMPROVED WRENCH.**—Calvin H. Crowell, Stockton. This invention consists in a novel arrangement for instantaneously setting the movable jaw or screw, of monkey wrenches, independent of the usual operating screw. It consists in mounting the movable jaw in such a manner that any considerable movement of the jaw can be quickly made to any point on the wrench bar, without the use of the nut and screw in the usual manner.

**DEVICE FOR TILTING CRUETS.**—Thos. A. Fitzsimons, Benicia. This invention relates to an arrangement of levers for tilting a suspended cruet, piteber or other vessel which contains a liquid and which is provided with a spout or nose from which the liquid is to be poured. The device is specially useful for enabling one to serve himself without inconvenience.

**WINDMILL.**—C. Fallin, Grangeville, Tulare Co. The improvement consists in the peculiar manner in which the fans are constructed. By the method adopted the inventor secures a noiseless, storm-proof and perfectly self-regulating mill, regulated in one case by the backward pressure caused by the centrifugal force of the fans and a weight combined, and again when its fans are balanced by the weights alone.

ALTHOUGH it is now legal to catch shad, none of that description of fish has yet appeared in the markets. The fishermen explain that the fish are still in salt water, and need not be expected in the rivers for a month or more.

### News in Brief.

AN international exhibition will be held at Milan in 1879.

THE Italian Chamber of Deputies has voted to abolish the death penalty.

NUMEROUS changes have been made in the city offices by the incoming municipal officials.

WILLIAM BUTLER was drowned by the upsetting of a boat at Cuffey's Cove on the 1st.

A \$45,000 fire occurred at the corner of Sixth and J streets, Sacramento, on the 29th inst.

COMMODORE CHARLES H. B. CALDWELL, United States Navy, died at Waltham, Mass., Friday night.

A FRANCHISE has been granted to the Ocean Beach Railroad Company for a railroad beginning at Fifth avenue and California street.

THE Ordish block at Watsonville, which cost \$10,000, was burned on the night of the 30th ult. Insurance, \$4,000.

A ROME correspondent states that the establishment of a Roman hierarchy in Scotland has been indefinitely postponed.

ADDITIONAL reports come of Indian outrages in the Black hills. General Crook has been ordered to afford relief to settlers there.

THE Second National Bank at Lafayette, Ind., has closed its doors on account of a defalcation by the Cashier.

SOME of the Supervisors of Rensselaer county, New York, have been indicted for fraudulently auditing bills against the county.

DURING the present month over \$3,000,000 in coin will be withdrawn from city circulation for the payment of State and municipal taxes.

THE automatic buoy outside the bar is reported a complete success. It can be heard distinctly four or five miles.

DR. WILLARD G. WAYMAN has been appointed a member of the State Board of Health, vice Dr. Herz, who is absent from the State.

THE Board of Supervisors of this city has ordered the purchase of the Point Lobos toll road, for \$25,000.

DISPATCHES state that there is a strong probability that the duties on tea and coffee will be restored during the coming session of Congress.

THE election of an assignee of Duncan's Bank will take place on the 19th inst. Only those who prove up their claims before that date will be entitled to take part in the election.

THE Santa Barbara Press states that stock is dying in many localities over the mountains. Oak brush has been cut to feed the cattle upon for some time.

COL. A. W. VON SCHMIDT has been on a visit to the wreck of the steamer *City of San Francisco*, and reports that there is no hope of ever saving the hull.

THE Republic Trust Company of Newark, N. J., have decided to discontinue business on account of difficulty in securing safe paying investments.

THE order granting Floyd and others to run a single track railroad down California street from Battery to Market, has been passed over the Mayor's veto.

THE Directors of the Philadelphia exhibition have determined to hold religious services on Sundays, but the clergymen have refused to officiate.

THE London Telegraph says it has received information that Kars fell through the treachery of a Pasha, who admitted the Russians to a commanding fort, and was paid for it.

HENRY KUPER, a tailor of this city, committed suicide on Sunday. Luis Ziegeuhert, a solicitor for Redington & Co., also committed suicide on the same day.

MAJOR PICO, arrested in Stockton for obtaining money under false pretences in the connection with the sale of land in Lower California, was tried on Friday and the case was dismissed.

THE following silver pieces were coined at the Philadelphia mint during November: Trade dollars, 400,000; half dollars, 834,000; quarter dollars, 722,400; dimes, 140,000. Total number of pieces, 2,096,400; value, \$1,011,000.

THE project once entertained of making Skeena river mouth the Pacific terminus of the Canadian railway, is abandoned. The choice lies between Butte and Burrard inlet. A decision is looked for shortly.

ABOUT 250 men are at work on the railroad between Benicia and Suisun. The track is being laid from Suisun across the tules, and the bridge across Cordelia creek is finished. With good weather, the track will be completed to Benicia by New Year's.

SINCE July 1st we have cleared only 48 cargoes of wheat, against 205 cargoes for the corresponding period last year. There are now 16 vessels, of 20,000 tons tonnage, in port under engagement to load wheat.

IT is doubted at the Vatican whether the Pope will ever again move from his bed. He looks well when recumbent, but when an attempt was made to dress him it was discovered that he could not sit upright.

OUR overland exports of treasure during November amounted to \$2,476,377, of which \$2,116,300 was in gold coin. We also sent \$753,115 to China, of which \$485,828 was in trade dollars; and \$23,000 to Central America—making a grand total of \$3,252,492.

A NEW Chinese theater has been opened in this city.

THE Jumel will case is about to be reversed, this time to claimants from France.

THE Society of California Pioneers have raised the admission fee from \$10 to \$100.

A SMALL steamer is to be placed on the upper Yamhill river, Oregon.

DIPHTHERIA is causing many deaths among children in Salt Lake.

THE British Indian expedition has so far met with uninterrupted success.

PHILIP DEVER of Marysville was accidentally shot while hunting near Marysville, last week.

SAM MILLS, of Nevada, found guilty of murder in July last, is to be hanged on December 21st.

WOODRUFF & ENNOR's stage to White Pine was stopped last Friday. The passengers were robbed of about \$150 in coin.

THE Indians are committing serious outrages in Texas, and the number of troops there is too small to afford protection to settlers.

SENATORS BOOTH and Jones were the only Republicans who voted against the Paris exposition bill.

THE British and German governments are making the telephone part of their telegraph system.

THE *Tuscarora*, surveying frigate, will soon proceed to the Gulf of California to complete work already far advanced.

THE Legislature has ordered the printing of 20,000 copies of the Special Senate Committee's report on Chinese immigration.

ADVICES from Chile state that the well-known Thomas' Bank of Valparaiso has failed. Liabilities, \$2,000,000.

THE Oakland Guard lost by the fire in their armory on Thanksgiving night, their arms and uniforms. The loss was \$4,000; insured for \$2,300.

THE directors of the narrow gauge railroad from Alameda to Los Gatos made the initial trip over the road this week.

CHIEF SCANNELL has been re-elected Chief of the San Francisco Fire Department by the new Board of Fire Commissioners.

A. MENKE's hop-drying house at Brighton, Sacramento county, was burned Sunday night. Loss about \$10,000.

ANDREAS MATEO was hanged at Napa on Tuesday of last week, for the murder of a man named Guadalupe on the 11th of June.

A fight occurred at Nord, Butte county, on Monday, between John Hallett and D. Wilson in which Wilson had his ear bitten off and Hallett was killed.

THE receipts from wharves for the month of November reached \$39,593; amount drawn from harbor improvement fund, \$17,466. Total, \$57,059. Disbursements, \$30,393; amount remitted to State Treasury, \$26,661.

MILTON S. LATHAM has sued the Universal Life Insurance Co., on an endowment policy for \$10,000, with profits payable when he should be 50 years old.

IN November there were 1,370 arrests made by our city police; 448 of them were drunks and 93 were charged with larceny. There were 207 voluntary lodgers in the city prison.

GERMANY has informed Switzerland that, subject to ratification by the German Parliament, it will contribute an additional \$2,000,000 toward the St. Gothard railway.

THE United States coast surveying schooner *Earnest* sailed from Baltimore November 6th for Puget Sound. She will go through the Straits of Magellan.

DURING November the mint in this city coined a total of 3,362,100 pieces, valued at \$4,216,500; \$3,194,500 was in gold, and \$1,022,000 in subsidiary silver. There were 146,000 double eagles.

LIMA dates of Nov. 12th say, that work on the Oroya railway and that of the Cerro De Pasco, together with the drainage of those famous mines, is about to receive a decided impulse.

DR. JOSEPH WALKER, of "Vinegar Bitters" fame, has been arrested on a charge of abandoning his wife. It is stated that his income is \$1,000,000 per annum.

THE new Directors of the Safe Deposit Company have decided to retain all the employees of the company, without any reduction of the salaries. The pay-roll amounts to about \$1,075 per month.

A DISPATCH from Coquimbo, Chile, says: The Pacific Steam Navigation Company's steamship *Atacama*, has been lost. The crew numbered 40 and the passengers about 50. Only 18 persons were saved.

A PETITION is being circulated, and has already received many signatures to have a steam fog whistle erected at Fort Point, as the one at South Head, which has been sustained by private enterprise for years past, is worn out and has been discontinued.

AMONG the amendments to the general deficiency bill reported by the Senate Appropriation Committee is one proposing an appropriation to pay claims allowed by the Treasury Department for services, supplies and transportation of Oregon and Washington Territory volunteers in the Indian war of 1865.



## The Chinese Problem.

The following petition to Congress emanates from the Chico Encampment of the Order of Caucasians, and W. B. G. Keller, Grand Secretary of the Order, says it has the endorsement of the entire body:

To the honorable Senators and Representatives of the United States, in Congress assembled:—The undersigned, citizens of the United States and of the State of California, respectfully represent: That the presence of Chinese in this State is a cause of great evil and of impending danger, which demands your earnest consideration. The well known habits and mode of life of the Chinese need only be mentioned to be admitted. They have no wish, nor do they intend, to become with us a homogeneous people. They look forward solely to the acquisition of a competence, and a return to China. They live upon a few cents' worth of rice per day, usually imported by their own merchants. They swarm together in large numbers in small rooms, thus saving rent, and at the same time engendering loathsome diseases. They have no families to support; but, on the contrary, the few women owned and kept by them are a source of profit. They are natural thieves, and property is unsafe everywhere from their wily and ingenious machinations. They are persistent liars, whom no court of justice, nor any resource known to our jurisprudence can control. Their natures and training enable them to live cheaper than it is possible for white men, with families, to do. They usurp and monopolize every department of labor in our country, whether suited to male or female, and they can and do fill every department of labor, at lower rates of wages than white men or women can live upon, and are, therefore, employed by capitalists and manufacturers. As a consequence of this condition of things, thousands of laboring men and women in the East, who would gladly seek homes in California, are deterred from coming to us; and the honest laborers of this State have been driven away, from their inability to support their families upon Chinese wages. There is another evil, arising from the residence of the Chinese among us, not so patent to casual observers, but of such magnitude as to cause a feeling of despondency for the future of our country. In every town of any magnitude there are dens of Chinese prostitution, open to the youths of our land—to very young boys—who are enticed thither by Chinese women—and who, for a few cents, can acquire a loathsome disease, ruin their constitutions and render themselves unfit to become the progenitors of a healthy and moral race. Trouble with the Chinese has already begun, and it is not incorrect to say that, however wrong the course may be, the people, urged to desperation, by a want of sympathy in, and a disregard for, their interests by the Government, believe that something must be done to protect and save their families from present and future destitution; and this belief—this desire to do something—is increasing at a rapid rate, and must, inevitably, bring about further collisions between the two races. To redress these grievances; to avert the danger which is surely impending; and to provide a happy and prosperous future for your suffering brethren, is not only a mark of wisdom and good policy, but is an imperative duty required at the hands of those intrusted with the legislation and the administration of public affairs. We, therefore, petition that the Burlingame Treaty be abrogated, or so modified, as to prevent the influx of Chinese to these shores, and for such other and necessary legislation as in your wisdom may be deemed requisite to relieve us of the blighting and deadly incalculable now pressing upon us. And we will, as in duty bound, ever pray, etc.

## Mining Share Market.

As mentioned elsewhere, the principal feature of the stock market for the week is the fact of Flood & O'Brien having obtained control of Ophir and Mexican. The brokers do not like this move very much, as it interferes with stock transactions. Still, if the new managers, as presumed, can work the mines one-third more economically by having them under one management, it will be better for stockholders than fluctuations in stocks. In this connection the Gold Hill News says:

The bonanza firm now controls the regular Virginia line of mines from the Chollar northward, and more concentration and unity of action may hereafter be looked for. It certainly will have a good effect in the matter of drainage, as in case of no compromise or arrangement being effected with the Sutro tunnel company, a combination can easily be formed to effect the drainage of the lower levels in some other way which might prove more advantageous than the tunnel. Moreover, if the bonanza folks will get the control of the mines, they must work and develop them. This has been a very expensive job thus far and it is no disadvantage to have somebody with plenty of money to foot the biggest portion of the expenses. The good prospects in Alta and the southern section of the lode generally continue. The transactions in the San Francisco Board for the week ending December 4th, aggregated \$3,000,000.

The Committee appointed to investigate the affairs of the Justice are reported as being diligently at work and will shortly make known the result of their labors.

## The Emma Mine.

EDITORS PRESS:—I will do justice to the London mining journals in saying that they did all in their power to convince the present Quixotic chairman of the Emma mining company, of London, to avoid lawsuits and its difficulties. He was informed of every circumstance by which he might have seen that he could have done his duty to the shareholders by accepting T. W. Parks' and Albert Grant's offer of \$250,000 hard cash if he would only have the mine properly worked. This amount was to be paid out of future profits. Three-quarters were to be paid to the largest shareholders, and one-quarter to pay off the \$250,000. Such an offer as that could only be refused by a man who was acting from interested motives. He was desirous of being looked upon as the savior of English commercial purity, and punishing, as he thought, all the promoters of the Emma mining company, heedless of their real interests, and endeavoring to make capital for being elected a member of Parliament. The gradual developments in the mine are convincing the unbelieving English public that there is a great future for the mine, and it will be proved soon who was right, Mr. H. Sewell, in advocating by every possible means the working of the mine, or the lawsuiting chairman, who in this undertaking was, of course, backed by the wrecking solicitor firm of F. Snell & Co., of London. The last act in this great mining drama will soon be represented. ONE WHO KNOWS.

## Musical Instruments.

The firm of Kohler & Chase, of 633 and 635 Clay street in this city, is an old established and trustworthy house, dealing in pianos, organs and all other kinds of musical instruments. They are extensive importers of instruments and instruction books, and have long held an enviable position in this branch of trade. We take pleasure in recommending them to all our readers who wish to introduce the refining influences of music to their homes. The firm make a specialty of the Decker Brothers' piano, the Mason & Hamlin cabinet organ, the Emerson piano and the J. & C. Fischer upright piano. All of these instruments have gained a wide fame for excellence and won high praise from those who know best what constitutes excellence in a musical instrument.

We would speak especially at this time of the Decker Brothers' piano. We cannot do better than present a testimonial of its quality, freely given by a group of musicians whose praise will commend itself to all music lovers. During the Centennial there was held in Philadelphia a grand musical congress, at which the Decker Brothers' instruments were used, and the result was the following straightforward endorsement:

PHILADELPHIA, June 27th, 1876. The Decker Brothers' Grand pianos, used by the Musical Congress at their grand operatic concerts and musical festivals, recently given at the American Academy of Music, were remarkable for their superior quality of tone and extraordinary power. Fine instruments we never heard. Clara Louise Kellogg, Annie Louise Cary, Zola Semini, Julia B. Rive, Esmeralda Cervantes, Joseph White, Max Maretzek, P. Brignoli, S. B. Mills, P. Ferranti, Franz Remmert, E. Beltracchi.

A matter which we would make most prominent in this connection is, that the Decker Brothers' name is the subject of attempts at counterfeiting. This is the penalty which the manufacturers of a first-class instrument have to pay for the gaining of a good name, and all our readers should be on their guard against imposition. Unprincipled parties have manufactured and sold cheap pianos under the names of "Decker," "Decker & Co.," "Decker & Brothers," "Becker Brothers," etc., doing business on the reputation and popularity of the celebrated Decker Brothers' pianos. All genuine Decker Brothers' pianos have their name in front on the pianos above the keys, viz.: Decker Brothers, New York. In all genuine Decker Brothers' square pianos the following words appear, cast upon the iron plate on the inner left-hand side of the instruments: Decker Brothers' patent, June 2d, 1863.

The simplest way to guard against imposition is to deal with those who are well known to be trustworthy. Kohler & Chase have a reputation of this character established by twenty years of business experience in this city.—*Pacific Rural Press*, Nov. 1st, 1877.

HYDRAULIC MINING.—The article on this subject from the pen of the well-known engineer, Ang. J. Bowie, Jr., which is now being published in the Press, is an especially valuable one, and our hydraulic mining friends will find it alone worth more than a year's subscription to the Press. The facts and figures given by Mr. Bowie are of great value as showing the results of practical work. A reliable article of this kind is more profitable for miners to read and study than any other class of literature. We advise those who do not usually file away the Press to commence keeping their numbers now and they will have this standard article as a whole. It has been carefully revised and corrected by Mr. Bowie and comprises the whole literature of hydraulic mining in California.

## METALS.

(WHOLESALE.)

THURSDAY, M., December 6, 1877.

IRON.		
American Pig, ton.	28 00	@ 32 00
Scotch Pig, ton.	32 00	@ 33 00
White Pig, ton.	28 00	@ 30 00
Oregon Pig, ton.	31 00	@ 32 00
Belmont Bar, 5 lb.	5 00	@ 6 00
Horse Shoe, 4 lb.	—	@ 7 00
Nail Rod, 1 lb.	—	@ 7 00
Norway, 1 lb.	—	@ 7 00
Roller, 1 lb.	—	@ 7 00
COPPER.		
Copper Tinned, 37 00	@ 40 00	
Sheathing, 1 lb.	37 00	@ 40 00
Sheathing, Yellow, 21 00	@ 22 00	
Sheathing, Old Yellow, 10 00	@ 11 00	
Composition Nails, 21 00	@ 22 00	
Composition Bolts, 21 00	@ 22 00	
STEEL.		
English Cast, 1 lb.	14 00	@ 15 00
Anderson & Woods, ordinary sizes, 16 00	@ 17 00	
Drill, 16 00	@ 17 00	
Flat Bar, 15 00	@ 16 00	
Round, 8 00	@ 12 00	
TIN PLATES.		
10x14 C Charcoal, 8 50	@ 9 00	
Bacon Tin, 24 00	@ 25 00	
Australian, 19 00	@ 20 00	
ZINC.		
By the Cask, 11 00	@ 12 00	
Zinc Sheet 7x1 ft, 7 to 10, lb., 11 00	@ 12 00	
7x3 ft, 11 to 14, 11 00	@ 12 00	
8x4 ft, 5 to 10, 12 00	@ 13 00	
8x4 ft, 11 to 10, 12 00	@ 13 00	
NAILS.		
Assorted sizes, 3 00	@ 3 25	
QUICKSILVER.		
By the lb., 47 00	@ 50 00	

## LEATHER.

(WHOLESALE.)

WEDNESDAY M., December 5, 1877.

Sole Leather, heavy, lb.	26 00	@ 29 00
Light, 22 00	@ 24 00	
Jodot, 8 Kil, doz.	48 00	@ 50 00
11 to 13 Kil, 65 00	@ 70 00	
14 to 15 Kil, 60 00	@ 65 00	
Second Choice, 11 to 15 Kil, 55 00	@ 60 00	
Cornellian, 12 to 15 Kil, 57 00	@ 60 00	
Females, 12 to 15 Kil, 63 00	@ 65 00	
14 to 15 Kil, 71 00	@ 75 00	
Simon Ulmo, Females, 12 to 15 Kil, 65 00	@ 65 00	
14 to 15 Kil, 65 00	@ 70 00	
15 to 17 Kil, 72 00	@ 74 00	
Simon, 15 Kil, 61 00	@ 63 00	
20 Kil, 62 00	@ 65 00	
24 Kil, 72 00	@ 74 00	
Rupert, 7 and 9 Kil, 35 00	@ 40 00	
Kips, French, lb., 1 00	@ 1 35	
at doz., 10 00	@ 15 00	
French Sheep, all colors, doz., 8 00	@ 15 00	
Eastern Sheep for Backs, lb., 1 00	@ 1 25	
Sheep Roans for Topping, all colors, doz., 9 00	@ 13 00	
Cal. Russet Sheep Linings, 5 50	@ 10 00	
20 Kil, 1 75	@ 4 50	
Boot Lugs, French Calf, pair, 4 00	@ 4 75	
Good French Calf, 5 00	@ 5 25	
Best Jodot Calf, 5 00	@ 5 25	
Leather, Harness, lb., 35 00	@ 38 00	
Fair Bridle, doz., 48 00	@ 75 00	
Skirting, lb., 33 00	@ 37 00	
Wet, doz., 30 00	@ 50 00	
Buff, doz., 15 00	@ 20 00	
Wax Side, 17 00	@ 18 00	

## Gold, Legal Tenders, Exchange, Etc.

[Corrected Weekly by SUTRO &amp; CO.]

SAN FRANCISCO, December 5, 3 P. M.  
 GOLD IN NEW YORK, 102 1/2.  
 GOLD BARS, \$200.00. SILVER BARS, \$14 3/4 cent. disc.  
 EXCHANGE ON NEW YORK, 1 1/2; on London bankers, 43 1/2; Commercial, 40; Paris, five francs 3/4 dollar; Mexican dollars, 85.  
 LONDON Consols, 95 3/4; Bonds, 106 1/2.  
 QUICKSILVER IN S. F., by the disk, 1 lb., 46 1/4 @ 47 1/4.

## Signal Service Meteorological Report.

Week Ending December 4, 1877.

HIGHEST AND LOWEST BAROMETER.							
Nov. 28	Nov. 29	Nov. 30	Dec. 1	Dec. 2	Dec. 3	Dec. 4	
30.14	30.14	30.07	30.04	30.16	30.20	30.30	
30.02	30.05	29.99	29.90	30.06	30.18	30.25	
MINIMUM AND MAXIMUM THERMOMETER.							
06	63	61	50	56	56	57	
55	52	51	49	47	47	47	
MEAN DAILY HUMIDITY.							
49	02	72	00	79	80	54	
PREVAILING WIND.							
W	W	NW	W	NW	N	NE	
WIND—MILES TRAVELED.							
127	123	140	104	140	03	119	
STATE OF WEATHER.							
Clear.	Fair.	Clear.	Rainy.	Clear.	Fair.	Clear.	
RAINFALL IN TWENTY-FOUR HOURS.							
			.23				
Total rain during the season, from July 1, 1877, 2.47 in.							

## To Mining Secretaries.

An amendment to Section 336 of the California Code, taking effect July 1st, 1874, provides that in addition to the regular publication, daily or weekly, of the assessment and sale notices as heretofore,

## PERSONAL NOTICE

Must be served as provided in the following quotation from the law:

"The notice must be personally served upon each stockholder, or in lieu of personal service, must be sent through the mail, addressed to each stockholder at his place of residence, if known, and if not known, at the place where he principal office of the Corporation is situated."

The above refers to the ASSESSMENT NOTICE only. Advertisers in the MINING AND SCIENTIFIC PRESS will be furnished with copies of assessment notices printed on slips suitable for serving personal notice under this law at short notice.

DEWEY &amp; CO., Publishers.

## Mining and Other Companies.

Persons interested in incorporated shares will do well to recommend the publication of the official notices of their companies in this paper, as the cheapest appropriate medium for the same.

**Advance Silver Mining Company.**—Location of principal place of business, San Francisco, California. Location of works, Monitor District, Alpine County, Cal.

Notice is hereby given that at a meeting of the Board of Directors, held on the twenty-first day of November, A. D. 1877, an assessment of fifty (50) cents per share was levied upon the capital stock of the corporation, payable immediately in U. S. gold coin, to the Secretary, at the office of the company, Room 16, No. 309 California Street, San Francisco, Cal.

Any stock upon which this assessment shall remain unpaid on the eighth day of January, 1878, will be delinquent and advertised for sale at public auction, and unless payment is made before, will be sold on Monday, the twenty-sixth day of January, 1878, to pay the delinquent assessment, together with costs of advertising and expenses of sale.

On the second day of January, 1878, will be delinquent and advertised for sale at public auction, and unless payment is made before, will be sold on the twenty-sixth day of January, 1878, at 2 P. M., to pay the delinquent assessment, together with costs of advertising and expenses of sale.

B. LINGLEY, Secy.  
 Office, Room 16, No. 309 California St., San Francisco, Cal.

## California and Oregon Land Company.

Location of principal place of business, San Francisco, Cal. Location of works, Jackson County, Oregon.

Notice.—There is delinquent upon the following described stock, on account of assessment No. 1, levied on the seventeenth day of October, 1877, the several amounts set opposite the names of the respective shareholders, as follows:

Name.	No. Certificate.	No. Shares.	Am't.
Allen, J. O., Administrator Estate of Isaac Allen.	98	500	\$175 00
Belcher, W. C.	48	500	175 00
Belcher, W. C.	49	500	175 00
Belcher, W. C.	50	500	175 00
Clark, J. W., Trustee.	125	1000	350 00

In accordance with law, and an order of the Board of Directors, made on the seventeenth day of October, 1877, so many shares of each parcel of such stock as may be necessary, will be sold at public auction, at the office of the company, Room 2, No. 415 California Street, San Francisco, California, on Monday the twenty-fourth day of December, 1877, at the hour of two o'clock P. M., of said day, to pay said delinquent assessment thereon, together with costs of advertising and expenses of sale.

J. W. CLARK, Secy.

## Manzanita Gold Mining Company.

Location of principal place of business, San Francisco, California. Location of works, Sulphur Creek, Colusa County, Cal.

Notice is hereby given that at a meeting of the Board of Directors, held on the third day of December, 1877, an assessment (No. 1) of ten (10) cents per share was levied upon the capital stock of the corporation, payable immediately in U. S. gold coin, to the Secretary, at the office of the company, No. 51 Fremont Street, San Francisco, Cal.

Any stock upon which this assessment shall remain unpaid on the eighth day of January, 1878, will be delinquent and advertised for sale at public auction; and unless payment is made before, will be sold on Thursday, the third day of January, 1878, to pay the delinquent assessment, together with costs of advertising and expenses of sale. By order of the Board of Directors.

GEO. S. SPRATT, Secy.  
 Office, 51 Fremont Street, San Francisco, Cal.

## Merced Mining and Water Company.

Location of principal place of business, San Francisco, California. Location of works, Quartzburg Mining District, Mormon Bar, Mariposa County, California.

Notice is hereby given that at a meeting of the Board of Directors, held on the third day of December, 1877, an assessment (No. 1) of ten (10) cents per share was levied upon the capital stock of the corporation, payable immediately in U. S. gold coin, to the Secretary, at the office of the company, No. 51 Fremont Street, San Francisco, Cal.

Any stock upon which this assessment shall remain unpaid on the eighth day of January, 1878, will be delinquent and advertised for sale at public auction; and unless payment is made before, will be sold on Thursday, the third day of January, 1878, to pay the delinquent assessment, together with costs of advertising and expenses of sale. By order of the Board of Directors.

GEO. S. SPRATT, Secy.  
 Office, 51 Fremont Street, San Francisco, Cal.

And in accordance with law, and an order of the Board of Directors, made on the seventh day of October, 1877, so many shares of each parcel of such stock as may be necessary, will be sold at public auction at the office of the company, No. 326 Pine Street, on the tenth day of December, 1877, at four o'clock P. M., of said day, to pay said delinquent assessment thereon, together with costs of advertising and expenses of sale.

F. T. HOUGHTON, Secretary,  
 Office, No. 326 Pine Street, San Francisco, California.

And in accordance with law, and an order of the Board of Directors, made on the seventh day of October, 1877, so many shares of each parcel of such stock as may be necessary, will be sold at public auction at the office of the company, No. 326 Pine Street, on the tenth day of December, 1877, at four o'clock P. M., of said day, to pay said delinquent assessment thereon, together with costs of advertising and expenses of sale.

F. T. HOUGHTON, Secretary,  
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## Iron and Machine Works.

THOS. PENDERGAST.

HENRY S. SMITH

### ÆTNA IRON WORKS,

MANUFACTURERS OF

### IRON CASTINGS

### and MACHINERY

OF ALL KINDS.

mont Street, Bet. Howard and Folsom

SAN FRANCISCO.

### SHEET IRON PIPE.

### Risdon Iron and Locomotive Works

Corner Howard and Beale Streets,

Are prepared to make SHEET IRON AND ASPHALTUM PIPE, of any size and for any pressure, and contract to lay the same where wanted, guaranteeing a perfect working pipe with the least amount of material.

Standard sizes of Railroad Car Wheels, with special patterns for Mining Cars. These small wheels are made of the best Car Wheel Iron, properly chilled, and can be fitted up with the improved axle and box—introduced by this company, and guaranteed to outlast any other wheels made in this State.

All kinds of Machinery made and repaired.

JOSEPH MOORE, Superintendent.

### PHELPS MANUFACTURING COMPANY,

Manufacturers of all kinds of

Wharf and Bridge Bolts, Railroad Trestle Work, Car Frames and Bolts, Machine Bolts, Set Screws and Tap Bolts, Lag or Coach Screws.

ALL SIZES OF FANCY HEAD BOLTS. HOT AND COLD PRESSED HEXAGONAL AND SQUARE NUTS, WASHERS, BOLT ENDS, TURNBUCKLES, ETC., ETC.

13, 15 & 17 Drumm St., near California, SAN FRANCISCO, CAL.

### SACRAMENTO BOILER WORKS,

37 Fremont St., cor. Mission S. F.

### HALL & KELSHAW,

PRACTICAL BOILER MAKERS,

Marine, Stationary and Portable Boilers, Smoke Stacks, Hydraulic Pipe, Oil or Water Tanks, Ore and Water Buckets, Gasometers, Girders, Bridges and Iron Ship Building.

### ALL KINDS OF SHEET IRON WORK.

Repairing promptly attended to at the lowest possible terms.

### GOLDEN STATE & MINERS' IRON WORKS.

Manufacture Iron Castings and Machinery of all kinds at Greatly Reduced Rates.

STEVENSON'S PATENT

### Mold-Board AMALGAMATORS,

Golden State Pressure Blowers.

First St., between Howard &amp; Folsom, S. F.

### UNION IRON WORKS,

SACRAMENTO, CAL.

ROOT, NELSON &amp; CO.,

MANUFACTURERS OF

### STEAM ENGINES, BOILERS AND ALL

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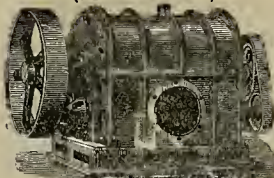
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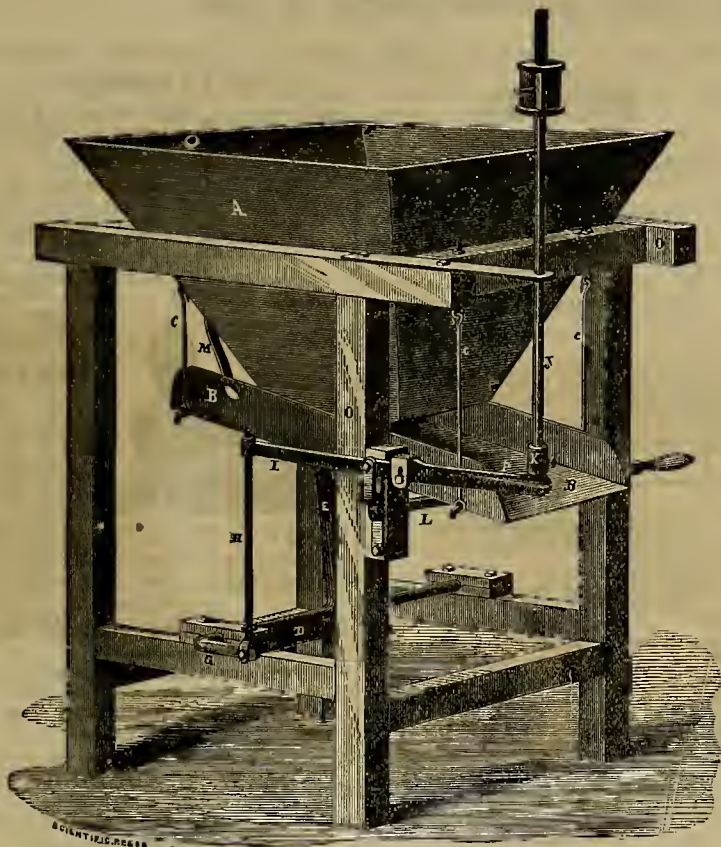
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As to my feeders having been thrown out of the Gold Stripe mill, they were not displaced for inefficiency, as the following letter will show, and it answers also as a complete refutation of Mr. Rodgers' statement:

OFFICE SUPERINTENDENT OF THE GOLD STRIPE G. M. CO.,

GREENVILLE, PLUMAS CO., Oct. 16th, 1877.

JOSHUA HENDY, Esq.—Dear Sir:—Your favor of the 15th instant at hand. In reply to your inquiry as to the working of your ore feeders at our mill, we can say that there is no fault in the machines, and we consider them the best now in use. At present they are not in use with us, owing to the construction of the mill, which we are about to rebuild and make proper arrangements for putting in your feeders.

J. K. OWEN.

Superintendent Gold Stripe Mine.

One of the principal owners of the Gold Stripe and Green Mountain mills is also largely interested in the Plumas National mine, where I have just shipped several feeders, showing the confidence placed in the machine by these gentlemen who have used it.

Now, if Mr. Rodgers is sincere in his belief as to the merits of a rival machine over mine, here is a chance for him to make a thousand dollars easily, if he can get the owners of the machine to lend him one for the trial, which is the only doubtful thing in connection with the matter. Mr. Rodgers' eight months' experience with both machines ought to give him confidence enough in his own convictions to accept the challenge offered to him, or any one else.

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# MINING AND SCIENTIFIC PRESS.

An Illustrated Journal of Mining, Popular Science and General News.

BY DEWEY & CO.,  
Patent Solicitors.

SAN FRANCISCO, SATURDAY, DECEMBER 15, 1877.

VOLUME XXXV.  
Number 24.

## Mine Locomotives for Gold Mines.

Description of the Mine Locomotive used by the Bald Mountain Gold Mining Co.

We present in this issue engravings of a mine locomotive which is now in use at the mines of the Bald Mountain gold mining company, at Forest City, California. It is employed in a tunnel 4,000 feet in length, in which is a track of only 20" gauge, laid with T rails, and having grades some of which are as steep as 220 feet per mile. The tunnel is four feet wide at the track and for 18 inches up; thence it tapers to two and one-half feet in width at the top. The extreme height from level of rails to the top of tunnel is five and one-half feet. The track has curves of from 60 to 150 feet radius. Small four-wheeled cars, having wheels 12 inches in diameter, and a wheel base of 20 inches, and which weigh 750 pounds each, and can carry two tons each, are used on this track. The ventilation is obtained from air shafts and air ways, without any blowers or furnaces, the current of air moving at the rate of about four miles per hour.

In the summer of 1876, Mr. H. W. Wallis, in behalf of the Bald Mountain gold mining company, opened a correspondence with the Baldwin Locomotive Works, of Philadelphia, with reference to a mine locomotive for working on this track. His requisition was for a locomotive to work by compressed air, if possible, some fears being entertained as to the practicability of working a coal burning locomotive, on account of the effect of the gasses on the ventilation. The Baldwin Locomotive Works, believing from their experience in the construction of mine locomotives for underground work in the coal mines of Pennsylvania, that a locomotive burning anthracite coal would be unobjectionable in the tunnel of the Bald Mountain mine, in view of the ventilation as described above, recommended such a machine for the purpose. They undertook to construct a locomotive which could haul 30 or 40 empty cars up the maximum grade in the tunnel, which was then assumed to be only 166 feet per mile. They estimated its consumption of fuel would be from 400 to 500 pounds of coal daily in hauling a total of 192 cars up the grade in eight hours.

The locomotive was ordered, constructed, and shipped in October, 1876. It reached its destination, and began service December 8th, 1876. The results of its work are fully and carefully stated in a letter from Mr. H. W. Wallis, of the Bald Mountain mining company, to Messrs. Burnham, Parry, Williams & Co., of Philadelphia, which we print below. The dimensions of the locomotive are mostly shown in the engraving. We add the following particulars of this engine: Cylinders, 8" x 12"; diameter of driving wheels, 24"; wheel base, 3 ft. 4"; tank capacity, 110 gallons; weight, in working order, 15,000 pounds; height, 61"; width across cylinders, 46 1/2"; width across tank, 39".

OFFICE BALD MOUNTAIN GOLD MINING CO.,  
FOREST CITY, CAL., May 13th, 1877.  
Messrs. Burnham, Parry, Williams & Co.—  
Gentlemen:—Your note making inquiry regarding the working of the mine locomotive built by you for us last fall has remained for some length of time unanswered, for the reason that our haul was too short to give a fair statement of its capacity. I am now able to furnish a statement of its work, although it is capable of doing twice the work which we have for it.

The locomotive has given entire satisfaction,

working completely in every respect; in fact, it is what engineers call a remarkably smart one, running since we had it without any repairs excepting replacing the cylinder heads, which were too tight. We find the tires too soft, causing them to wear rapidly. The estimates made by you were under its capacity, and cost of operating. We can haul 45 of our cars with 80 men and 10 loads of timber and material, up our grade and into the mine, making the trip in five minutes, or at the rate of nine miles per hour. We can bring out 18 loaded cars with the locomotive alone, with the use of the brake which we put on here. We have no brakemen. We use anthracite coal, and find no deleterious effects from steam or gas on our ventilation. Our air shaft is sunk 2,000 feet from the mouth of the tunnel, and is in two compartments of 3 1/2 feet square each. At the top we drop two inches of water into the center of each compartment, which forces a strong

Cost per car-load, 4 1/2 cts.—2 3/4 cts. per ton; distance run, not including switching, 200 miles; mule power costs 9 cts. per car-load; man power costs 21 cents per car-load.

H. W. WALLIS.

In relation to the above facts we are told that the locomotive described is of the greatest utility, and fills a want long felt amongst miners, viz.: the economic and rapid moving of large quantities of pay gravel through long tunnels. This engine is so constructed that it will work well in any ordinary sized tunnel and on heavy grades, where mule power is impracticable, on account of the number of brakemen required. The machine will be extremely useful in any mine with a 2,000-foot tunnel, and moving any considerable amount of dirt. Any further information concerning these locomotives

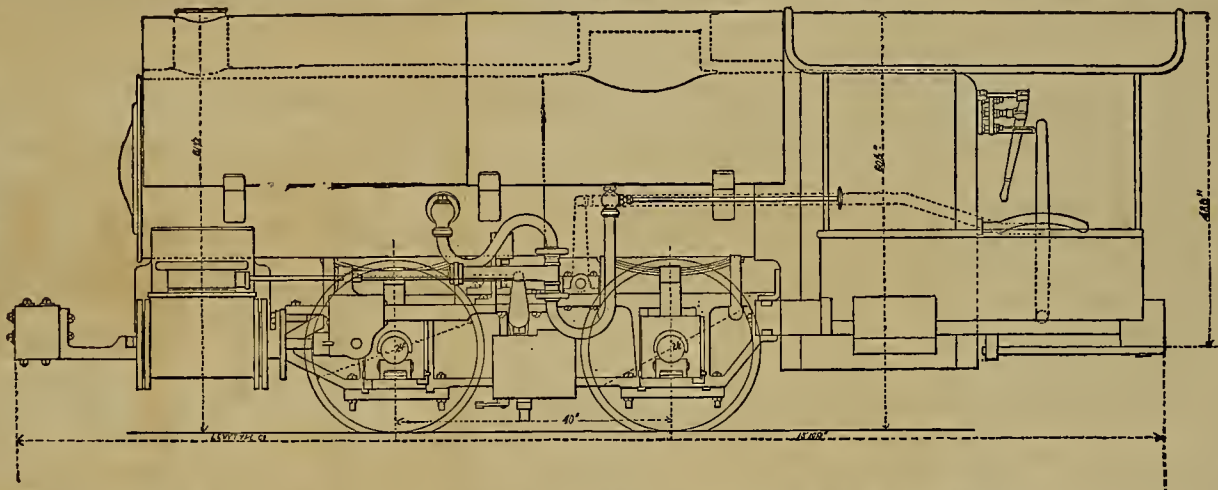
## Wealth—A Few Thoughts for the Times.

[Written for the Press by J. L. BOONE.]

We can write down as one of the laws of nature the following maxim: "Let every man succeed according to his talents." If a man is naturally endowed with superior talent in one direction, he is capable of accomplishing more in that direction than his less gifted neighbor or competitor. Natural capacity counts more in the race of life than education, practice or hard work. It is when all four of these requirements are combined in one individual, to a greater or less extent, that he becomes powerful, brilliant and a leader of his fellows in his business or profession. Take a Digger Indian that has talent in any direction, give him education, experience and a will to succeed and he will succeed. Education, experience or hard work will accomplish much separately, but they must be kept at the work to retain what they gain, otherwise it will gradually slip away. You can fill a sieve with sand if you keep at work and pile it in fast enough, but stop the accumulation a moment and the sieve is as empty as it was before. Divide the riches of the world equally amongst the people, regardless of their capacity, and, like water seeking its level, it will concentrate itself again into the very hands that now hold it. Why? Because it requires a special talent to accumulate money, and the best indication of that development

is the fact that these persons once accumulated it. Again, the capacity of an individual to accumulate riches is not so much in his superior faculty for getting hold of money as it is in his superior faculty for keeping what he does get hold of. In other words, he is a sieve with an imperforate bottom, every drop of sand that enters remains. Such a nature must necessarily be mean and sordid to a certain extent, for every generous action, every Christian impulse, makes a hole in the bottom of his sieve, and his accumulations begin to run out.

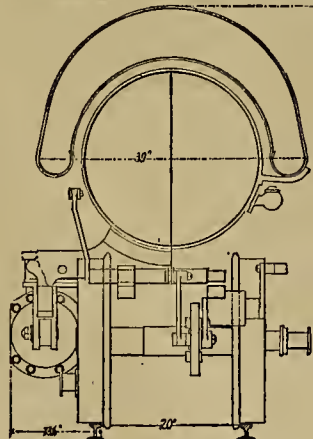
Rich to-day, poor to-morrow, is the motto of the energetic hard worker who is deficient in the talent or natural capacity to get rich. How many 49ers, who accumulated upon their perforated sieve bottoms large fortunes when gold dust was measured in quart cups, and 20-dollar pieces were used as convenient pebbles for throwing at a mark, retained what they had accumulated when the supply became less plenty. Extravagance, shiftlessness, passion and vice are all enemies of the rich man; so are charities and social pleasures. It is a common saying that such and such men are rich in spite of themselves, that they spend their money freely, but always seem to have enough. Fortune is fickle. It does, sometimes, seem to favor certain individuals, but hold on for a while, the end must come, and it always does come. Such fortunate individuals in the end are usually the most unfortunate. Luck is a favorite term. Many, like the ancient mythologists, have planted a star in the firmament which they call "Luck," and to it they how down as to a god. They pray for luck. Luck is a cowardly assassin. It is a sneak thief, the devil's assistant. It is a reward to the underserving, a blessing to the accursed. The hope of luck creates misery, damns souls and disorganizes society. Out with it. The sweat of an honest brow brings profit, an easy conscience, charity, good will toward our fellows, and learns us to appreciate its fruits so that our sieve has enough perforations to accomplish good, but is imperforate enough to contain all the balance.



MINE LOCOMOTIVE MADE AT THE BALDWIN LOCOMOTIVE WORKS.

current of air down the shaft and through the air-ways, giving the air to the workmen first and carrying off the steam and what little gas is generated from the coal. We have already made a saving of more than the cost of the locomotive and attending expenses in the working of the mine.

The following is a statement for the week of



End View of Locomotive.

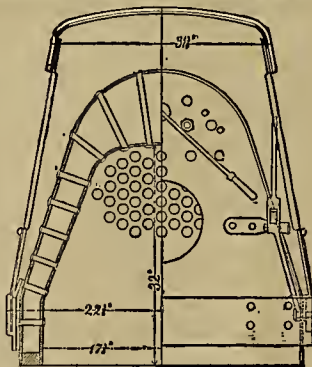
six days now closed, which is a fair comparison with all of the work:

Length of haul, 3,800 feet; grade, 166 to 220 feet per mile; weight of cars, 750 pounds each; diameter wheels, 12 inches; wheel base 20 inches; gauge of track, 20 inches; cars each carry two tons; carloads gravel taken out for week 2,936=5,872 tons

4,370 pounds Anthracite coal	.....	\$87 40
Engineer's wages	.....	48 00
Head lights, oil and tallow	.....	4 10
Total	.....	\$139 50

tives will no doubt be furnished by the manufacturers to any one addressing them.

BULLION SHIPMENTS.—Since our last issue shipments of bullion from the prominent mines have been as follows: California, Dec. 6th, \$339,530.81; Chollar-Potosi, 5th, \$10,019.87; Con. Virginia, 6th, \$238,002.62; Tybo, 6th, \$4,078.14; Grand Prize, 11th, \$18,300; Alps, 10th, \$3,056; Standard, 8th, \$39,425.92; Martin White, 10th, \$17,084; Northern Belle, 8th, \$2,



Section of Mine Locomotive.

606.10; Leopard, 11th, \$5,900; Tybo, 8th, \$8,313.79; Alps, 11th, \$1,300; Arizona, 11th, \$1,623.12; Con. Virginia, 11th, \$405,488.06.

At Santiago, Chile, a perfect shower of lawsuits are pending, instituted by purchasers of the Paraf shares, to recover their money, on the ground that the alleged discovery being untrue, there was no consideration given, and that, consequently, the sales were void. Some of these suits are said to be already compromised. Paraf is in jail.



## CORRESPONDENCE.

It is the desire of the editors of this journal to be liberal toward all correspondents, and therefore statements and opinions are frequently published, on the authority of the writers, for which we do not assume responsibility.

### Mechanical Ore Concentration.

EDITORS PRESS:—Mr. F. M. F. Cazin, in replying to my article on the Hendy concentrator, takes issue with my views on the subject in a sense not aimed at when my invitation for discussion and criticism was made. Such invitation was incorporated with my article, because of a sense of the fallibility of individual opinions on complex subjects and the difficulty of expressing them briefly in such a manner as to be correctly understood by others. The mind, preoccupied by a certain train of thought, is prone to pass by unheeded points of importance, and individual experience on any practical operation is never exhaustive in details, no matter how extensive it may be. The hope of getting nearer the truth by the views of others was the main incentive in inviting discussion so "pointedly," and I admit that I speculated no little thereby on the extensive theoretical and practical knowledge of which I know Mr. Cazin to be possessed.

That Mr. Cazin did not enter into the details of principles elucidated by me, but devoted so much of his remarks to a generalizing tirade against Mr. Hendy, I regret, for the elucidation of those principles was the main object of my article, as the heading of it indicates. I would have preferred to learn in what details I really am at fault, for in the matter selected by him for particular criticism, we are essentially not at variance, if Mr. Cazin will give my language its full significance and if he will view my remarks in the light of my expressions in previous contributions to the PRESS.

With the defense of Mr. Hendy's course as an inventor, I have nothing to do. In my opinion, Mr. H. acted wisely in devoting himself to the perfecting of one machine, of whose merits and demerits he had ample practical opportunity to inform himself, and in leaving to competition the successful introduction of others, which have been proved useful under conditions so different, and in localities so remote, that Mr. Hendy could have no sufficient opportunity to assure himself by independent observation of their excellence. Mr. Hendy has been a successful inventor and has the caution in accepting things new to him which an intelligent inventor's experience is sure to teach. If Mr. Hendy has naturally been an earnest advocate of his meritorious invention, it does not therefore follow that the latter is to be considered a panacea for all requirements of mechanical ore concentration and that he or anyone else recognizing the merits of his machine therefore rejects such others, "as for limited action in proper places are far superior and more reliable." If Mr. Hendy does not recognize the merits of such other machines for such specified purposes, it, no doubt, is because the peculiar conditions of the art in this country have not given him the opportunity of seeing these claims verified by successful application here.

In so far as the article in question is calculated to foster such one-sided views, it can only do so in the case of inattentive or prejudiced readers, for its whole bent is to circumscribe the limits of action most favorable to the working of the Hendy pan, and the very machines referred to by Mr. Cazin "for limited action in proper places," are recommended by him for such action in such places, as desirable auxiliaries to the operation with the Hendy pan. In this connection I may state that among the many constructions for sand jiggers, Mr. Cazin's is one of the simplest and best, though there are others which will answer the same purpose no less satisfactorily in every respect.

As for Mr. Cazin's classification of machinery, the principles which he sets up for the distinction of good and objectionable machinery have my full approval, but I insist that his own designations of successful qualities would place the Hendy pan in the foremost rank of useful concentrating machines. Its construction is as simple as that of any automatic machine of the same capacity in actual use which can be produced as suitable for the same work, and is sufficient if reasonable and timely attention is paid to it. That its merits are permanent is amply attested by the length of time during which it has been before the mining public and the signal manner in which it has outlived many competitors, also by the fact that many of our most important mills, in which they have been for years in constant use, retain them and will continue to use them.

It does not follow, that because the theoretical explanation of the action is complex that the practical application is necessarily so, for not every detail of action needs special attention, because many of them combined can be the effect of a leading cause, such as, for instance, speed of motion and volume of pulp, etc. The successful use of any machine requires the presence of a number of indispensable conditions, which accounts for the difference of success in the use of them. The number of such conditions for the successful working of the Hendy pan is not greater than is the case with any of the machines which Mr. Cazin has described, for I am practically acquainted with the working of every one of them, except his one-plunger jig.

I can also assure Mr. Cazin that scores of Mr. Hendy's machines are worked in this State and elsewhere by men who never had any instruction from Mr. Hendy, and that they do the work permanently, persistently, and smoothly, nevertheless. The regulation is not difficult, because it admits of considerable license, and the repairs are attended with no more difficulty than in the case of any other automatic concentrating machine. What I claim for the machine, principally, is its financial success under certain conditions, which is even more marked than its technical one, for the reasons amply explained in my article. Mr. Cazin can form a conception of this when I assure him that a 40-stamp mill, crushing 80 tons ore per 24 hours, and running all the pulp through Hendy's pans (after amalgamation in the battery and on copper plate outside) requires the services of only four laborers in 24 hours to keep 22 Hendy's running permanently, persistently, and smoothly; attending at the same time to all regulations and repair, and performing all other work connected therewith. I doubt that the yield could be profitably increased to any considerable extent, and positively assert that no machinery or combination of machinery which Mr. Cazin has described, could be substituted to do the work with same ultimate economy.

But all this does not make the Hendy a panacea for all purposes, but merely aspires to do what Mr. Cazin would have us, *i. e.*, giving to each machine its proper sphere of work. I have drawn the limit plainly, suggested the proper substitutes outside of these limits, and broadly defined my position and claims by the expression: Introducing the treatment for coarse stuff suggested, and perhaps, also that for the finest in the case of rich sulphurets, I will say, that of all the concentrating machines at present in successful practical use for wet concentration, either in Europe or America, none will effect the concentration of medium grade sands, under the peculiar conditions presented in our amalgamating stamp mills, with equal ultimate economy, as the Hendy in its present form, when properly used; and none of them can compete with it in the effectual working of unsized and ungraded sand, where systematic concentration, by reason of the nature of the ore, cannot be made the leading consideration in the treatment.

Coming to the discussion of those points of my article particularly objected to by Mr. Cazin, I beg leave to say that I fail to see in his exposition a proof that the science of mechanical ore concentration has emancipated itself from the nomenclature with which Rittinger more or less labeled, or that the search of the intelligent mind for the reason why, the rational elucidation of phenomena seeking cause for effect, the theoretical origin of actions, at all interferes with the more important attention to practical purposes, or that it holds, or ever will hold, any other relation to it than does theory to practice in any other technical question or pursuit. I must admit, that I cannot fully comprehend Mr. Cazin's meaning in the paragraph here referred.

The attempt to translate the idioms of another language naturally leads to various expressions by different translators. If usage accept "equal falling" as the best definition of the German word "*gleichförmig*," I am satisfied, though the English expression may be styled a Germanized one. From the first I chose to call the particles so treated "graded," the action "grading," and the apparatus used thereto "graders," because the word, in my opinion, presented the briefest expression to indicate the prominent characteristic of the material, etc., to which it was applied. The term "water sizing" has also been used—in some cases simply "sizing." To this latter expression I object, because the word conveys the idea that size, or approximate equality of size, is the prominent characteristic of its action. This term was found more applicable to the work of graduated sieves, or classification was used synonymously to approach more nearly the nomenclature of Rittinger. In this sense the terms are used throughout all my articles on concentration, for want of any authoritative English expression for the same purpose.

To be a little more explicit, but to avoid a full explanation, as not relevant to the subject. I defined graded "particles assorted according to their equivalent speed of fall in water." This expression Mr. Cazin criticises as if reading: According to their *equal* speed of fall in water. I insist on the use of my words, and emphatically object to the substitution of the word equal for the word equivalent, and if Mr. Cazin has any valuation of the English language he will sustain my objection. Not equal speed is the distinction, but such speeds of the particles as are equivalent to the attainment of a certain end or effect, *i. e.*, the sinking of the particles to and below a certain depth within a given time. That I am aware of the differences of initial speed, no one can doubt that reads my article attentively, for on this ground, among others, the separation in the Hendy pan is explained. It is also intimated by mentioning its cause in speaking of fine sand jiggers in my article, "Krom vs. Rittinger," PRESS 1876, page 2. Moreover, any one can amply inform himself in the matter by consulting Rittinger's Appendix I, 1870, page 18. The subject is there more thoroughly treated than in Mr. Cazin's treatise in the MINING AND SCIENTIFIC PRESS, May 5th, 1877, and to the information there given by Rittinger, Mr. Cazin and "the trade," so far as I can learn, has added nothing new. Professional theory has therefore not to yield to governing practice, and common sense is not

in favor of the laborer and contrary to the scientist, as Mr. Cazin so pointedly puts it, for in this matter they are not at variance; many years have passed since they were elucidated by theory and verified by practical experiment conjointly, this being the basis on which nearly all of Rittinger's doctrines have been built up. If any one man ever had superlative ability for elucidating theory in these matters, and at the same time extraordinary facilities for verifying it by practical observation and careful, systematized experimentation, it was Rittinger, and for this reason his opinions are justly considered authoritative. To claim his views as *sole authority*, and to consider his opinions unconditionally correct in all things relating to concentration, even, would be presuming an infallibility which I refuse to recognize as within the reach of the human mind.

If I am not mistaken in the hints, Mr. Cazin would have me looked upon as a scientific theorist in the art of concentration. If this be so, let me assure Mr. Cazin that I can give him ample reference regarding my *practical* experience and ability in this line.

As objectionable in my article, Mr. Cazin further cites the expression, "It has been accepted as an axiom *almost* in rational concentration that sizing or grading of the material is absolutely necessary to effect a good separation with any concentrating machine." If I am not mistaken in the weight of English words, this is far from being a generality. It does not express that it has always been, or is, or everywhere has been accepted as an axiom, unconditionally, but *almost*, to effect a good separation. As for the example which Mr. Cazin gives to sustain his objection, he might have chosen one more to the point, because of practical importance, by taking the case of separation with quicksilver, instead of referring vaguely\* to the use of zinc vitriol solution (or another salt solution, susceptible of high density), which latter, for obvious reasons, though serving as interesting experiments, have little or no practical value.

In writing my article, it was not my aim to branch out on every detail, but I chose to intimate instead, where not expressed, conditions qualifying, as briefly as possible, by the turn of words, thus paying more attention "to practical purposes." If, therefore, the axiom, as Mr. Cazin says, is not a general one—which I do not claim it to be—it is sufficient for us to have his assurance that "it is such for all successful apparatuses in actual use," for these are the ones with which we deal.

CHAS. C. RUEGER.

Benicia, Cal., Dec. 2d, 1877.

\* I am very much interested to learn of Mr. Cazin what medium he does refer to, for such an one above 1.59 Sp. gr. (excepting quicksilver) is unknown to me.

### Arizona Mines.

EDITORS PRESS:—I will not, at the present writing, attempt any detailed account of the mines and mining interests in this Territory, nor say much about any particular property or locality, but give merely such information of a general kind as I have been able to pick up in regard to the condition and prospect of things here since my arrival in June last. There is, as you have no doubt observed, a constant disposition among mining men to Compare Arizona with the State of Nevada; A very natural and proper thing to do, considering that they are both great mineral bearing countries, and that of the latter we already possess a good deal of practical knowledge. This knowledge of the older we like to apply to the newer region, both as a means of avoiding former mistakes and furthering the work of its physical development. In their climate, topography and agricultural resources the two countries are not widely unlike. Here, as in Nevada, climatic differences depend greatly on altitude, the low lying plateaus, desert plains and river valleys being hot in summer, and free from snow at all seasons, while at greater elevations the summer temperature is moderate, some snow falling in the winter, the summits of the higher mountains being covered with snow for five or six months in the year, and in a few instances the whole year round. With these variations, the climate here is, at corresponding altitudes, from five to ten degrees warmer than in most parts of Nevada, there being a considerable area in the southern portion of that State depressed below the sea level, which has an almost tropical climate. Our rainfall occurs mostly during the summer months, and is usually quite heavy. In Nevada they have frequent showers in the summer, confined, chiefly, to the mountains, but the precipitation takes place there mostly in the spring, or in the form of snow during the fall and winter. On an average, a greater amount of water falls here than in that State, and, coming in the summer, is of more benefit to the growing crops.

#### The Topography of Both Countries

It is marked by long chains of nearly parallel mountains, with a generally north and south trend, and separated by a series of alternating valleys, the latter spreading out often into great plains, and forming the desert lands characteristic of both regions. The most of the mountains consist of high, narrow ridges, though they are sometimes broken up, forming a broad belt of straggling ranges, or flatten out into vast arid and timberless meads. We do not find here, however, the tall mountains proper, such as are seen in certain parts of California. In the more southerly part of Arizona this system of alternating mountains and valleys is by no means so well preserved as in northern and

central Nevada. Here, as there, the timber is usually found in the mountains, only cottonwood, mesquite and willow being met with elsewhere. A greater variety of woods grow here than in the Silver State, and, generally, our timber is more widely distributed and of a better quality. We have fewer of the alkali flats and mud lakes, and none of the "sinks" that form a peculiar feature of that region. In their place, however, we have the tremendous canyons of the upper Colorado, gorges hardly equaled elsewhere in nature, while we can boast of at least one navigable river skirting our borders. In fact, as regards

#### Rivers, Springs and Mountain Streams

We are able to make a much better showing than our northern neighbors. The Colorado, which, after crossing the entire northern part of the Territory, forms its whole western border, carries during the summer an immense volume of water and is at all times a river of respectable magnitude, being even at its lowest stages navigable for 500 miles or more. After passing 100 miles east of this river the mountains abound with running streams, many of them large and never failing, the water always of the purest kind.

#### As a Grazing and Farming Country

Arizona is much ahead of Nevada, there being here a large scope of good agricultural land, while the grasses are varied in kind, perennial and abundant. For sheep and stock raising this is one of the best regions west of the Rocky mountains, pasturage being plentiful and the climate mild and healthful. In process of time, our flocks and herds will constitute a source of wealth second only to that afforded by

#### Our Mines.

Of which I can in this letter say but little. That we have not in this department of industry been able to make a larger production than has yet been done has not been so much the fault of the mines as of other and extrinsic causes, chief of which has been the lack of means to open them up and outfit them with suitable reduction works. Notwithstanding the good showing of rich ores our mines have made during the past year, but little outside aid has yet been extended to them. What little money has been invested here has been mostly in the purchase of mines, not half a dozen of mills having meantime been brought into the Territory. What we most need just now is a little money to help open up some of the rich ledges that exist here. The amount need not be large, as enough ore could in most cases be taken out, when once tools, supplies and hoisting works were on the ground, to defray current expenses. Without a dime to his name, the miner, however rich his claims, can do nothing, and these men are always willing to give to parties furnishing money to prospect their lodes a liberal interest therein. If only we could have the assessments paid on half a dozen unproductive Comstock claims scattered over two or three of the best districts here, it would be pretty sure to reward the investors many hundred fold.

#### What We Want and What We Can Do.

In the more recent immigration only three classes of men have come to Arizona: The laboring man without means, the speculator, intent on securing any sort of property for gambling purposes, and the capitalist or his agent seeking to buy a valuable mine for a nominal price. Let now the capitalist or his agent come here, and, taking his time, look about, and when he sees anything that suits him act in a spirit of liberality and fairness, and he need not go away without getting properties that will turn out satisfactory in the end. He can extract the ores himself, select his samples and have them tested by our local assayers, of whom we have here several that stand at the head of their profession. In this town we have a number, all thoroughly competent, some of them being skilled metallurgists and chemists as well. At Pickett Post, near the Silver King mine, Prof. Henry Degroot, Jr., has opened an assay office, whereat he is doing a large business, this being an important mining center where an establishment of the kind was much needed. This young man has become very popular with our mining community, he being not only a capable and trustworthy assayer but possessing in addition that intuitive knowledge of ores that enables him to indicate the methods best suited for their reduction, a faculty that renders him doubly useful in his calling. Not only can parties have their ores well assayed here, but they can obtain small lots to be worked, if they desire it, making all required tests on the ground. To men who have even a little money and think of embarking in mining; this is, above all others, the place to come to. There are more ledges in the Pioneer and Globe districts showing rich ores on the surface than have ever been found in the whole State of Nevada. Parties coming here need not buy these properties outright. They can bond them, buy them conditionally, get them, in fact, on almost any terms they choose to propose, having all the time they want to prospect and open them up.

We may not succeed in developing down this way another Comstock. What is even more certain we shall not spend millions upon millions and impoverish multitudes of people in looking for ore. If we do not find here lodes that will give vast wealth to a few we shall surely find those that will bring moderate enrichment to many, thereby increasing that stable and well-to-do element that forms the mainstay of every community. A good word from our friends and a little cash from almost any quarter is what we most want just now.

I. L. M.



## MECHANICAL PROGRESS.

## Making Miners' Tools.

Mr. R. Goldsworthy has been awarded a prize for the best essay on mining machinery by an English society. We take from the essay the following hints. In the making of borers, the best borer steel should be used, which will be found the most economical in the end and is fast superseding the iron bar with steeled end. These borers may be of less diameter and being more rigid will transmit the blow with greater force and are more easily carried about the mine. They should be annealed at the striking end to prevent flying and splitting. Foul blows and irregular turning will do more damage to the tools than anything else, and this should be observed, that the fault may not be attributed to the smith. Good coal is also a necessary adjunct to the work of the smith and the making and keeping in repair of steel tools. Dirty coal no doubt injures the composition of the steel and its best qualities are somewhat impaired. For boring in very hard ground the bit may be tempered to a straw color; for mild ground, to a bright blue.

If mallets are made from rolled bar iron, care must be taken that the eye is not punched with the grain but across it. Fagotted iron bars are now mostly used and sold at the various manufacturing, with scrap iron hammered to all sizes and for all uses. This iron will punch any way and the mallets never split or crack as when made in rolled iron, but solid cast-steel sledges, mallets, hammers, borers and picks, etc., are now easily procured and will be found the most economical in the long run. If purchased of a good manufacturer and receiving fair usage they are exceedingly durable. It is not necessary to enumerate the many forms now in use, with their names, dimensions and weights; they are well known and need but ordinary care to make them. Let the eye be punched quite true, that the shaft may set square, and, if possible, tempered under a running stream of clean water.

The pick is the handiest tool the miner has. Made well, properly set and used with skill, there is no more valuable tool the miner can carry to his labors. Many forms have been used for various kinds of work and different character of ground, but the Cornish poll picks, as made for hard and soft ground respectively, are good tools for the metalliferous miner, with the exception of the eye, which might be improved perhaps by making it twice as deep, that it may obtain a firmer hold on the shaft, making it a stronger lever and prevent it from winching, more compact and not liable to become loose. This can be effected by purchasing the iron drawn from the hammer to form, leaving a thick lump for the eye. The molds might also be forced into a die, having a drift fixed in same, and punch the eye nearly through, thus facilitating the work of the smith very much and the difference in cost—taking a gross of picks through to the finish—should not be felt. The picks and shafts would stand a great deal more wear and render strapping the handles and numerous other devices for fixing the same unnecessary.

Shovels should all be plated or hammered from best selected scrap iron, which process of manufacture alone will insure a good quality of iron, and being steeled with the best steel, leaves nothing to be desired.

## The Age of Steel.

Mr. Lowthian Bell, the English expert, is well known to be of the opinion that the age of iron is approaching its close, and that steel will eventually take its place; and the object upon which the energies of that gentleman have for some time been concentrated is to produce steel from the puddling furnace by a direct process. He candidly told his hearers at Newcastle that "two-a-days, so far as anterior products were concerned, it was neither bar iron nor pig iron they required, but steel; and, however their interests might deceive them into the belief that malleable iron was going to retain the position it had occupied for some thousands of years, there was no doubt in his mind that steel was destined to supplant it." It cannot be ignored, says the London *Telegraph*, that, at least as regards rails, the hulls and boilers of metal ships, and many other articles, patent facts yield increasing support to the forecast of Mr. Lowthian Bell. In consequence of the increasing preference given to steel for rails, the iron rail trade of South Wales and Middlesborough has almost entirely disappeared. When railway companies renew their permanent way, if it should happen to have been formerly laid with iron, they now invariably substitute steel, for the sufficient reason that rails of the latter metal will wear three or four times longer than those made of the former, notwithstanding that steel rails cost only 10 shillings per ton more than iron ones. Besides, Floyd's have already sanctioned the construction of steel ships at a reduction of 25% on the stantling required in the case of iron vessels; and the advantages in favor of steel, in respect of durability, lightness and capacity for accommodating freight, are self-evident. Steel bridges span the great rivers of America and the dykes of Holland,

and it cannot be long before the security of this material for similar purposes in England is generally recognized. There is, however, an important consideration which, in a commercial point of view, might be regarded as a drawback to the displacement of iron by steel. If, for example, steel rails will last 16 years instead of four—the average duration of iron rails—and if steel vessels last proportionately long, it is obvious that, unless enterprise in these departments develops on a scale vast beyond anticipation, the greater durability of the one metal, as compared with the other, will prevent orders from being so frequently repeated for replacing wasted material.

## Encouragement to Poor Inventors.

Every movement which enables poor but worthy inventors to bring forward the results of their labor for public study, is worthy of praise, and is an agency toward mechanical progress. We are much interested in reading in an English exchange of the "Inventors' Institute," which was organized for promoting and protecting the interests of the less wealthy class of inventors intending to offer evidence of their ingenuity at the International exhibition of 1882. The late Mr. R. Marsden Latham conceived the happy idea of inaugurating an institute which should bring together the previously divided and not very satisfied class—inventors—in such a manner that all should be led to comprehend that they had many interests in common, and that it was to their mutual advantage to act in concert. In a very short time the list of members, under the presidency of Sir David Brewster, included a large proportion of the leading inventors of the country, Whitworth, Bessemer, Siemens, Varley, and others of equal repute, occupying positions in the council. Sir David Brewster, and several other warm supporters of the Institute, have passed away, and others have grown too old to take the same active part in the business of the society as formerly, but in the secretaryship the original founder has been succeeded by his colleague, Mr. F. W. Campin, who is equally well acquainted with the requirements of the members, and thus the Inventors' Institute retains vitality, and will inaugurate its 16th annual session at the rooms of the Royal Society of Literature, Charing-Cross, on November 29th, under the presidency of Sir Antonio Brady, J. P., F. G. S., who has ever been recognized as a warm advocate of inventors' rights, and who, during the time he has occupied his present position, has given great satisfaction to the members from the energy he has displayed in connection with every movement on their behalf, and on behalf of inventors in general. It is but reasonable to anticipate that in view of the forthcoming International exhibition at Paris, the numerical strength of the Institute will largely increase, as it is not unreasonably suggested that whatever may be the advantage of membership in connection with international exhibitions in England, it must be far greater in connection with those in countries the language and customs of which are different.

ADJUSTABLE JOURNALS FOR CURVES.—At a late meeting of mechanical engineers in England, Mr. H. W. Widmark described a new device, which afforded a means for the lateral and radial motion of the axle of locomotives while running round curves in the road. The following is a description of this design. Each pair of guides—always cast in one piece, whether fixed to the main frames of the engine or to cross frames—is distinct from the other and is bored to a cylindrical surface, the axis of which is in the same line as the spring pillar. An intermediate guide or box, the outer surface of which is turned so as to fit easily in the outer guide, can have a turning motion round its axis and also an up and down motion, as may be required by the elasticity of the springs or the roughness of the road. The axle-box has planed parallel sides and is free to slide in a direction which is rectilinear and horizontal but inclined to the axle of the wheels. The box at the opposite end of the axle is inclined in the opposite direction; so that, when the wheels and axles deviate towards one side in consequence of the curvature of the road, the axle is simultaneously set in an oblique position to the engine frame but radial to the road, one end being advanced in relation to the frame whilst the other is drawn back by the inclined form of the axle-boxes and the intermediate guides. Moreover, the axle-boxes are free to turn round a horizontal axis, which is at right angles to these side planes. Thus one axle-box may rise and the other fall in the guides, as required by the state of the road. In the writer's design each axle-box system becomes a universal joint, for there is a vertical turning of the inside guide in the outer one, a horizontal turning of the axle-box in the inner guide and also, of course, the turning of the axle-box round the axle; thus there is no possibility of the axle becoming jammed in the guides. As in this design the axle-box travels in a direction which is rectilinear, it is easy to arrange inclined planes on the top of the box and corresponding inclined planes on a sliding piece which is held by the inner guide and takes the thrust of the spring. By this means an elasticity is given to the axle or a tendency to come back to a central position when not constrained by the curvature of the line.

## SCIENTIFIC PROGRESS.

## The Color and Fragrance of Flowers.

Prof Vogel discourses pleasantly on "The Color and Fragrance of Flowers" in the *International Review*, wherein he says: "The chemical transformations in the bodies of living plants, by which the most manifold and brilliant colors are produced, are almost entirely unknown to us. We see a flower pass through the entire scale of red, from the softest pink to the darkest purple-brown; but can give no explanation whatever of the mysterious process. We know, for instance, that the light of the sun greatly influences the color of living plants, and experience has taught us that in most cases its total exclusion is equivalent to the absence of every color; in other words, that it produces white leaves and blossoms. However, this rule is by no means without exception, as many roots, the roots of *Alcanna*, for instance, although buried in the soil, and completely secluded from the rays of the sun, possess a strong and vivid color. We can explain neither the rule nor the exception: on the contrary, we know that, as far as lifeless matter is concerned, mineral or vegetable colors are weakened, and gradually destroyed, rather than enhanced, by the action of the light. Our ignorance in this respect restricts our influence upon the coloration of flowers and blossoms to a very modest and merely empirical one. A mere chance has led to the discovery that the infusion of sulphates of iron into the soil darkens the hue of certain plants which contain a considerable quantity of tannin; and gardeners have profited by this discovery for the culture of the *Hortensia (Hydrangea)*. But these examples are rare; and as yet we must renounce all claim to the control and influence of the natural course of things in this field. We may be able to change the color of a plant or flower by transferring it into another soil; but we are never sure of the result, and cannot give any scientific explanation of it.

"The fragrance of a flower is likewise produced by chemical action which hitherto has escaped our closest investigations; we see the result; we see that a flower, like the bee which transforms pollen into honey and wax, fabricates volatile oils out of air, water, and light; but the chemical process itself is a complete mystery to us. We only know that the slowness or rapidity of the evaporation of these oils is the cause of the stronger or weaker odor of the flower. The mode of their formation is a good example of the unlimited variability and manifold variety of vegetation's chemical powers. Many plants do not limit themselves to the formation of a certain volatile oil in their blossoms or flowers, but produce at the same time various kinds of oils in their different parts. The orange tree, for instance, produces volatile oils in the leaves, flowers, and the rind of its fruit. A close investigation convinces us that these differ, not only in their smell and taste, but also in their weight, density, and other physical and chemical qualities; that, in short, they are different and independent substances which cannot be mistaken for each other. The same plant must therefore possess three different organisms, by which it generates three entirely different substances out of the same ingredients. What chemical laboratory, be it ever so well furnished and skillfully managed, can boast of results in any respect so wonderful?"

A FOSSIL FUNGUS.—Not alone to our period do fungi belong. At a recent meeting of the Woolhope Club, Hereford, Mr. Worthington G. Smith, F. L. S., read a paper on a "fossil fungus," which he has named *Peronosporites antiquarius*, and which he explained. It was found in the scalariform axis of the stem of a *Lepidodendron* from the coal-measures, and therefore indicating a remote antiquity. Mr. Smith said that no description, except that of a Mucor, also from the coal-measures, had hitherto been published of any well-defined fungus belonging to the Paleozoic series of rocks. The specimen of the fungus now under consideration shows one of the most interesting groups of threads and fruit, or, more properly speaking, mycelia and zoospores (or oogonia) as seen with the vascular axis of the *Leidodendron*. A close examination of the mycelium shows that it is supplied with numerous joints or septa. This seems to favor the conclusion that this fossil parasite belongs to *Peronospora*. One of the most perfect groups of these Paleozoic bladders containing the once mobile spores having been enlarged to 400 diameters, revealed the remarkable circumstance that the bladder is exactly the same in size and character with average oogonia of the present day, especially with the same organisms belonging to *Peronospora infestans*, or the potato fungus. The contained zoospores are likewise similar in form and dimensions with the zoospores of *Peronospora infestans* when measured to the ten-thousandth of an inch, so that when enlarged and engraved, and placed side by side, they appear to be identical. Mr. Smith adds that in this fungus we probably have one of the simple primordial plants of the great family of fungi, and that if *Peronospora* is an Alga, we have in *Peronosporites antiquarius* a plant which, from its extreme antiquity, lends some favor to the views of Sachs and other evolutionists who place the lower Algae amongst the primeval plants for which fungi and all other cellular Cryptogams have branched.

## How are the Colors Set in Enamel.

To answer the above question, the *Jeweler and Silversmith* gained an interview with M. Piguet of New York city, who has lately introduced this art to this country. We quote a few paragraphs: "When I first began here I had to make my own enamel. You see, one must be sure he has enamel, and not some counterfeit material or other, called by that name, to deal with, or else he must surely fail. Having become satisfied that my gold or other metal is covered with the genuine article I am ready to begin. The material we use in painting are made to unite with enamel alone, and ultimately, as you will see, form part of it. If we should be deceived in our enamel we cannot succeed. Well, we find that satisfactory. These fine powders which you see here of different colors are what I use, after admixture properly upon my palette, for the paintings. These powders are actually enamels themselves, and are obtained by the colormaker from that material, and are handed to me and I pulverize and triturate them. Then I prepare them for use. Then I begin my work. I study the forms to be reproduced, and I faintly delineate them with the proper pigments upon the smooth surface of the enamels. Then having obtained this much I submit the material to the action of fire. The object of this is to burn the colors into the enamel, so that they become an integral part of the whole substance. This is a most delicate operation, requiring much experience and skill. Too much fire will ruin it, and too little heat will be insufficient to make the colors natural and ineradicable. It is actually painting by heat, for a certain degree of fire gives intensity to color or varies the shade, affecting the tone and quality of the painting. Then I resume my painting, filling in and giving shade and substance to the object. Then fire has to be called into requisition once more, and as skillfully and delicately controlled as previously; one little mistake and alas! all our labor is for naught. But we rarely make any slips nowadays. Then come the final touches; the delicate lines. Then the final action of fire and you have this fine delicate portrait on the porcelain, whose smooth surface, as you rub your hand over it, shows you that the colors are a part of the whole surface."

FATAL PARASITIC WORMS IN DOGS.—The New York *Independent* condenses from Chinese newspapers an account of a discovery why dogs in China are liable to sudden and apparently unaccountable death. This is often found to be due to the plugging of the pulmonary artery, or to mechanical interference with the action of the valves of the heart, by a mass of flariae, or worms, occupying the artery and cavities on the right side. On opening the heart the worms are found matted together in a bundle, like a coil of thick cat-gut that has been some time steeping in water. The few sluggish movements they exhibit after the death of the dog form a striking contrast to the liveliness of their minute progeny, which wriggle about in the neighborhood and in the blood throughout the system. On unraveling and extending the parent worms, they can be separated into two kinds. One sort, the larger and plumper, measure from 8 to 13 inches in length by 1-30 of an inch in diameter; the other, the smaller, five to seven inches in length by 1-40 of an inch in diameter. Their progeny are about 1-100 of an inch in length by 1-3,000 of an inch in breadth. A similar disease to this is known in America, France, Italy and other countries. Dr. Manson, in his report on these Hematozoa, is inclined to believe that the great frequency of aortic aneurism among Europeans in China might possibly be traceable to the existence of these worms in the heart and blood-vessels. With the practice he has acquired in the detection of these worms in the blood of the dog, he searched for them in man. No selection was made of cases; but the first patient or healthy person who presented himself and was willing to have his fingers pricked was examined, six slides of blood, at least, being carefully searched. In this way he of 190 cases found the worms in 15 or about 8%.

THE TORTOISE AS A BAROMETER.—M. J. P. Bouchard, says the London *Farmer*, publishes the results of a series of observations he has made for some years past on the habits of the common tortoise as indicative of approaching changes in the weather, more especially of sudden reductions of temperature. At the end of autumn, if a severe winter is at hand the tortoises bury themselves deeply in the ground so as to be completely hidden. If, on the contrary, the winter is about to be exceptionally mild, as was the case last year, they only go just sufficiently deep to cover the openings of the carapace. Taking last winter as an example, he found that they emerged from their retreats during a mild January, and their return to them late in February was shortly followed by severe frosts. One day in March, while the thermometer was standing at 50° Fahr., the tortoises suddenly retired, and the same night it fell to only two degrees above freezing point. Five times in the month of April their disappearance gave timely warning of approaching frosts, and in every instance the warning was justified by the result. M. Bouchard states that by regular attention to the movements of these sensitive weather prophets, he has been able for years past to avoid danger from unexpected night frosts in his numerous glass-houses.







# MINING SUMMARY.

The following is mostly condensed from journals published in the interior, in proximity to the mines mentioned.

## California.

### AMADOR.

**CROWN POINT.**—Amador Ledger, Dec. 8: The superintendent informs us that the first clean-up of this mine, since the mill resumed operations, was made last Sunday. A run of 12 days with 10 stamps yielded the gratifying sum of \$1,200. Flackoning 16 tons per day, which is about the average capacity of the mill, the quartz would thus surrender an average of \$2 per ton. This result is deemed highly satisfactory. It is regarded by the stockholders as the beginning of a long era of prosperity in the history of the most promising quartz claim of Drytown.

**GOLDEN GATE.**—This quartz claim is situated at Amador City, and is the northern extension of the Eclipse property. G. W. Kiling and O. C. Fowitt are the owners. Work was started the 20th of last month. A shaft eight by six feet is down 10 feet. It is in the neighborhood of the famous Keystone, and on the main mineral belt, and these facts ought to be sufficient to stimulate its development.

**LINCOLN.**—The Lincoln mill is to be started up as soon as possible. The Superintendent, S. D. R. Stewart, tells us that both mine and mill will be running inside of a month.

**TIZ HALEY QUARTZ CLAIM.**—At Murphy's ridge, was sold at administrator's sale on Monday for \$900. I. N. DeWitt, administrator of the estate of B. Haley, was the purchaser.

**J. A. DAVIS' new quartz mill,** one mile south of the Phoenix, is all ready for crushing.

**TIZ ORIGINAL AMADOR MILL,** at Amador City, is running 15 stamps. There are 1,000 tons of rock broken, on the dump and in the mine.

**THE ONEIDA.**—Amador Dispatch, Dec. 8: A very rich and extensive body of ore has recently been struck, by crosscutting, in the Oneida mine. It cannot yet be estimated how extensive this body is, but it is by no means diminutive. The vein on which work has been going on, is also yielding very handsomely—the clean-up of last month being over \$20,000.

**AMERICAN FLAT GRAVEL CLAIM.**—Extensive operations are now under full headway to thoroughly develop the rich gravel deposits of American Flat, near Fiddletown. The claim is owned by a substantial San Francisco company, which is now constructing a large bedrock flume from some point on Purinton's water ditch to the Flat. When this flume is completed, it will probably be the means of working a number of small but rich placer and gravel claims that have heretofore been almost worthless. Times are said to be living up a little around the old nautical burg.

### CALAVERAS.

**MOSQUITO GULCH.**—Calaveras Chronicle, Dec. 8: The new pumps of the Banner have arrived and the "Col." is happy. Spaulding is pushing things and will soon have a crushing that will compare with the old record of this valuable property.

**HOLMES' MINE.**—The tunnel is in nearly 400 feet and has struck a four-foot vein which prospects fine. The mill is being put in order for active operation.

**VALENTINE.**—Work is progressing on this mine and about 10 men are employed. The company are putting up a mill, work on which is progressing finely.

**SAN BARTHOLOMEW.**—Big cave in 200 feet and no one hurt.

**HARRY HAINES' MINE** down about 35 feet and good rock is being taken out. The men are at work and three tons per day is the average. The last crushing was \$70 per ton. The rock at present looks better than ever.

**THE BONANZA KINGS, Potter & Rodgers,** have just received their returns from a valuable lot of "Blue Jay" specimens, and of course they are in good humor over it. The Blue Jay is being energetically worked and the pure stuff still holds good.

**THE CHERRY CREEK.**—Work is still progressing. This mine bids fair to out rival all others in the camp. At a meeting of the Directors, John L. Hoy was appointed Superintendent.

### INYO.

**THE REX MONTIS MINE.**—Inyo Independent, Dec. 8: The principal part of the heavy timbers and other material for the new mill for the Rex Montis is now on the ground, and we presume the work of constructing it will soon begin. The design is to make it one of the most complete 10-stamp mills in this part of the State. The old mill continues to hammer away without material interruption.

**BULLION SHIPMENT.**—Thursday's stage took out four boxes of Rex Montis bullion, weighing 236 pounds, and valued at \$2,300.

**PREPARING FOR WORK.**—We have at reliable authority that M. A. Wheeler, as agent for the Swansea company, has contracted with the Inyo Wood & Coal Company for wood and coal with which to start up the old Swansea furnaces on or about the beginning of the new year. Enough ore has been secured from different parties in Cerro Gordo, including a quantity on hand belonging to the company, to keep the furnaces running about three months, by which time it is hoped the company's mines will be able to furnish sufficient for continuous work.

**ANOTHER STRIKE IN PANAMINT.**—On Wednesday the news reached Darwin that the small force of men left to work for the Surprise Valley company, Panamint, had struck a body of very rich ore in crosscutting the main shaft in the Hemlock mine, and at a depth, as we understand the matter, of about 700 feet from the surface. This body of ore is from seven to eight feet in width, quite as rich and of the same general characteristics as the surface bodies which gave the mine a great name and value in the first instance, but which deposits all panned out in less than 300 feet from the top, as did similar ore bodies in all other mines in the district. From that point, or thereabouts, downward to 700 feet, the greatest depth attained, the rock has been perfectly barren, though the ledge never diminished in size in the least. In consequence of this fact, the company had about virtually abandoned further prospecting as hopeless. Of course the extent of the new ore body remains to be determined.

**BULLION SHIPMENTS.**—Coso Mining News, Dec. 8: The Emigrant mining company, by Peter Taylor, Superintendent, shipped per Wells, Fargo & Co., 103 pounds of fine bullion, valued at \$2,000. The total value of shipments from Wells, Fargo & Co.'s office, at this place, for the month of November, was \$13,000.

**BULLION COMPANY.**—A party in from Snow's canyon, a day or two ago, states that the mill of the Sheldon mining company was started up last Tuesday morning. We hope to be able to report, in due time, a successful run and a large shipment of gold bullion. The success of this company will have the effect to encourage others having locations near them, and we may look for the advancement this season, the high tide of development, of a section of country which has been idle for some time.

**MONOC.**—Superintendent Gupitt and Mr. Tibbetts, book-keeper, of the Monoc, were both in this week and say that everything at the works is progressing very favorably. Some 50 men are employed in the mines and the main tunnel and the daily developments are quite satisfactory. We are glad to see that operations at the Monoc are being carried on in a more careful and economical manner than characterized the management of former superintendents.

**MINNETTA.**—C. M. Blair, business manager of the Minnetta, informs us that work on their mines was resumed a short time ago and their little financial troubles are gradually being overcome.

### MONO.

**BENTON BULLION SHIPMENTS.**—Inyo Independent, Dec.

8: The following shipments, per Wells, Fargo & Co., of bullion for the year and for the last month, November, is not so very extensive, but it shows the permanency and regularity of this little camp at Benton: For the year, \$337,929.40; for November, \$92,211.

**BODIE DISTRICT.**—Virginia Enterprise, Dec. 5: The town of Bodie presents quite a lively and bustling appearance. There, also, the people are doing a good deal of prospecting and are making many new locations.

A very rich strike has just been made at the Red Cloud mine in a winze at the depth of 13 feet below the surface. The ledge is four feet in width and the foot-wall is a streak some 10 inches in width which is a conglomerate of clay, quartz and gold. Samples taken from this streak have assayed as high as \$31,801 per ton in gold and \$5,321 in silver, or a total of \$37,125. Toward the hanging wall the vein shows much bromide and chloride of silver.

The new shaft of the Red Cloud, a short distance west of this ledge, has struck a strong vein of quartz very much resembling that found in the Standard mine, and assays \$35 in gold and \$32 in silver.

Having struck water in their incline at a depth of 500 feet, the Standard company are now sinking a vertical shaft in which to place a pump, when they may thoroughly prospect their mine. They now have in sight in the Standard ore sufficient to yield over \$2,000,000, insuring them a fortune of \$1,000,000.

The Syndicate tunnel is at a distance of 800 feet, and they are now about to crosscut for their veins at a depth of 700 feet below the surface.

The Bechtel company have commenced extracting ore, which is being shipped to the Syndicate mill. Their vein is five feet (strong) in width, and mills \$100 per ton.

With gold prospects also plentiful, the Bechtel company have commenced crosscutting for their ledge, in the Savage, adjoining the Standard on the south.

Mr. Daly has bought a half interest, the consideration named being \$12,500. The owners of the other half are J. G. Haynie and H. M. Yerington.

The people of Bodie seem to have taken new heart and new life, and after a long season of semi-torpority, are waking up and going to work again in earnest.

### NEVADA.

**PENNSYLVANIA CO.**—Grass Valley Union, Dec. 8: The location of the lead of this company is near Mary's ravine, beyond Ophir hill, a section rich in gold-bearing quartz veins. The ground was divided into two lots without machinery, but the present season having been unusually dry surface water is not very troublesome, and the company have been able to sink with a windlass. They have now got down a shaft 56 feet, and at that depth have a ledge 22 inches, which shows plentifully in free gold—rock that it is estimated will go from \$70 to \$80 to the load. If the season will permit, crushings will soon be made. The ore is of the same quality as the company are sanguine that they have one of the very best leads in the district.

**PLANET GRAVEL MINE.**—The Planet Gravel M. Co., whose ground is situated near Steep Hollow, has disposed of 20,000 shares of stock, being the full amount set aside to raise a working fund. The stock has been much sought after, as the ground is believed to be very valuable. A contract for running 300 feet into the channel was let last spring, and work has been steadily prosecuted. The tunnel is now in 547 feet, and it is hoped to strike the pay channel during the month of February. The company is in ample funds, and work will be driven as fast as the nature of the ground will permit.

**CHAMPION MINE.**—The deep tunnel of the Champion M. Co., opposite the Providence mine, near Nevada City, is being driven rapidly and quietly, and new contracts have been given out as soon as the old ones are completed. The first run will be 1,000 feet on the New Year's ledge, one of the Providence series of quartz veins; then a crosscut will be made westwardly to the Champion ledge, for 1,500 feet. Total length of tunnel, 3,500 feet. This tunnel will prospect that section pretty well, and the backs will be made for the four feet of the channel. A number of rich chutes will be struck in this long run. The Providence quartz belt is one of the greatest in the country, and developments will not be wanting. The Providence ledges are of enormous size and one of them assays all the way from \$1,000 to \$15,000 per ton. The Champion mine has funds on hand for two years to come, without resorting to assessments, a circumstance which is most commendable in the mining industry.

**THE MURCHIE MINE.**—We mentioned, the other day, that the "Big Blue" ledge in the Murchie mine, at Nevada, would soon be reached on the 400-ft level, and it was anticipated that a fine vein would be opened. The vein has been reached sooner than was expected and the company has good cause for congratulation upon its splendid appearance. Yesterday the workmen had crossed the vein into the main tunnel, and the ledge was exposed. From the fact that the ledge is showing a width of from four to five feet in the 200-ft level, there is every reason to believe that it will prove as wide or wider on the 400-ft level. But the most important thing in connection with the opening of the ledge on the 400-ft level is that the ore has improved greatly in appearance and assays run high. We are informed by a gentleman, who is most competent judge with no view to any interest in the mine, that it is the finest showing that he has seen in the country and he is sanguine that the mine has now a great and prosperous future before it and destined to take rank as a leading mine.

**MATTERS UP THE RIDGE.**—San Juan Times, Dec. 8: Dr. Stolar, who went up the ridge to Bloomfield, Sunday, and from there to Blue Tent, informs us that every company between that place and North Bloomfield has closed down—even the Malakoff company—owing to the scarcity of water, and the same at Blue Tent. A water famine such as this is unparalleled at this season.

**PAYING OFF.**—Nevada Transcript, Dec. 7: Hon. Wm. Watt and A. B. Brady, Esq., visited the Watt and DeWitt mines on Wednesday last, for the purpose of making the regular monthly payments. These two companies have since their organization disbursed nearly \$100,000 for machinery and labor, and it is hoped that their efforts will not go unrewarded. The channel extending through Bloomfield township, and upon which the above mines are located, is one of the richest of all blue gravel leads in this State, and although an immense amount of labor and money have been expended upon it in the past, there is no indication of its being exhausted for many years hence. Should these two companies be successful in their efforts to strike pay dirt—and we have every reason to believe they will—other companies will immediately spring up, and before another year elapses the Bloomfield district will have assumed such an air of bustling activity on account of the hundreds of miners who will grow into the rich field, as to clearly demonstrate that California's big bonanzas are not things of the past.

### TULARE.

**WONGS MINE.**—Iron Age, Dec. 6: There are but few men now engaged in the Mineral King mines. Under the authority of the assignee in bankruptcy, of the New England tunnel and smelting company, certain parties are running a tunnel on the Black Wolf claim, owned by that company, and are working three shifts, making about 18 inches in 24 hours. It is expected to tap the lead at the lowest possible level in June next. At the Ship mine, the venture of two men running through and are well supplied for a winter's siege among interminable snow drifts. On the south fork of the Kaweah, Messrs. Ballou & Palmer have recently struck a lead of argenteiferous galena, which assays about \$105 in silver to the ton of galena.

### SIERRA.

**THE SAVAGE PLACER MINE.**—Virginia Enterprise, Dec. 7: This mine is situated in Sierra county, California, between the south and middle forks of the Yuba, and is on the main ridge through which passes the ancient river channel on which are situated the Bald Mountain and other rich blue gravel mines. The owners, with one exception, are Constockers. They began operations not long since by starting a shaft. They have sunk 60 feet through lava and have now just reached gravel. Water was found when the gravel was struck, and as they have

only an ordinary bucket and wadlows, they have been able to sink but three or four feet into the gravel, and in doing that have been obliged to take out three buckets of water to one of dirt. As the snow falls to the depth of from 20 to 25 feet the mine is no more work will be undertaken this winter. It will be necessary to set up at the shaft a small pumping and hoisting engine, and this they are afraid to undertake at this season, when a heavy fall of snow may be expected at almost any time. Next spring they will begin work in good earnest. Spire Mooney of this place has received from his brother, H. Mooney, who is superintending the sinking of the shaft, a small box of the ore that has been taken from the mine, and contains particles of gold, though they expect to sink to the depth of 220 feet before reaching bedrock. Their prospects for finding a rich mine are certainly very flattering. They have an abundance of wood and water on their ground.

## Nevada.

### WASHOE DISTRICT.

**CALIFORNIA.**—Gold Hill News, Dec. 12: Daily yield 650 tons of ore. The ore stops on the 1500, 1000 and 1050-ft levels are all yielding good ore, and show no material change during the week. The usual monthly dividend, aggregating \$1,000, was declared on the 7th. The mill is now ready to run, and the future prospects of the mine look bright and prosperous. On the 1500-ft level a drift east is being run to explore the ore body to the eastward of No. 5 ore stops, and on the 1050-ft level a drift is being run to the eastward to connect with the main north drift on the same level. On the 1050-ft level everything is in complete readiness to begin the hoisting of Cox, Virginia. Daily yield 600 tons of ore, keeping the mills running, and crushing to their full capacities. The yield of bullion for the month of November was \$1,417,103—and the usual monthly dividend of \$2 per share, aggregating \$1,080,000, was declared on the 7th. The ore stops in almost every portion of the mine are showing well and yielding good ore. On the 1200-ft level they are widening out to the south and westward. On the 1300-ft level they are in splendid condition for the rapid extraction of the ore, which is very rich. On the 1400-ft level the yield is excellent and the ore good. On the 1500-ft level preparations are nearly completed for the extraction of ore from the southern body. On the 1650-ft level everything is again in readiness to commence the extraction and hoisting of ore through the main shaft; while on the 1750-ft level the openings in the ore vein are showing finely at almost every point.

**SAVOAGE.**—The work of putting in the new lift pump at the 2000-ft station of the main incline will be finished by the last of this week. In the meantime the water is held by the pumps below the station until everything is in readiness to start up the new lift. As soon as that is accomplished, draining the flow of water from the lower levels will be resumed.

**ALTA.**—Driving the new drift to cut the ore vein on the 1150-ft level is making excellent progress. The prospecting operations on the 1050-ft level are showing more favorable as the work advances.

**ORINA.**—The new Superintendent has gone vigorously to work to enlarge the sump in the vertical shaft, and complete the water tanks and the excavation for the pump below on the 1000-ft level, recognizing the fact at once that if a strong flow of water is struck in the ore vein on the 1000-ft level, a way must be provided to handle it. The south drift on the east side of the ore vein on the 1000-ft level is steadily advancing, the face still in porphyry. During the week, whenever the drift appeared to near the ore vein, the flow of water increased so rapidly in the face that it was deemed better to change the course of the water back to the left, into a firm rock, to avoid flooding the drift and a stoppage of the work. Nothing has been done during the week in the face of the south drift from the incline on this level, and nothing probably can be done until the pumps and tank station at the main shaft are completed. On Friday last a drift east was started on the 1300-ft level to reach the newly discovered ore vein on that level.

**JUSTICE.**—The water has been let down from the face of the south drift on the 1100-ft level, and work resumed at that point. A drift north on the ore on this level has been started, the face of which is still in good ore. Three crosscuts east have also been started, one opposite the shaft and one to the northward, and the other to the southward of the shaft, all of which are being driven ahead to cut the ore vein. The shaft has reached the 1200-ft level, and is being continued downward to make a sump room. Sinking the winze below the 1000-ft level, to connect with the 1100-ft level, is going steadily ahead, the bottom still in ore.

**JULIA CO.**—Driving east crosscut No. 10 from the main south drift on the 1800-ft level is making good headway, the face still in very favorable ledge matter. The face of the crosscut No. 6, on the same level, is in a much more favorable vein formation than for some time past. There is a strong flow of very hot water from the face of this drift.

**BULLION.**—Sinking the main incline, to connect with the 1340-ft level, has been resumed and is making good headway. The rock in the bottom works well. The north drift on the 3000-ft level is steadily advancing, the face in porphyry. The ore vein is showing a very favorable ore-bearing quartz, of a much more favorable description than any of the quartz bodies found on the upper levels.

**YELLOW JACKET.**—The main drift east on the 2200-ft level continues in very hard blasting rock, being porphyry with streaks of quartz. On the same level the drift north toward the Imperial is advancing at a good rate, with its face in favorable looking porphyry and quartz, carrying a good deal of gold. No other prospecting or development work is being done on this level, owing to the great heat and lack of ventilation.

**BEST & BELCHER.**—Sinking the joint winze below the 1700-ft level is making steady progress, the rock in the bottom being somewhat harder than it has for some time past. It is the intention to start a prospecting joint crosscut on the Gould & Curry line, on the 1900-ft level, to prospect that portion of the mine in a very few days.

**GOULD & CURRY.**—The west drift on the 1800-ft level is steadily following up the drill hole recently run to tap the water in the bottom of the main incline. This water has been sufficiently drained to admit of a resumption of work in the bottom of the incline.

**SILVER HILL.**—The north drift on the 650-ft level has completed the connection with the Justice, and thereby obtained a good circulation of pure air. A crosscut east to prospect the ore vein has been started from this drift at a point 200 feet south of the Justice line.

**BELCHER.**—Sinking the air shaft incline is going ahead at a favorable rate. The winze below the 1000-ft level is being pushed ahead vigorously, following the foot-wall of the ore vein, and is showing a favorable character as greater depth is attained.

**MEXICAN.**—Sinking the joint Ophir winze below the 1700-ft level is being pushed steadily ahead to reach the 1000-ft level of the Ophir, at which point preparations are being made to connect the north drift with the bottom of the winze and thereby ventilate the lower levels of both the Ophir and Mexican mines. The north drift on the 1800-ft level is making good progress, the face still in very favorable vein matter.

**CON. INFERNAL.**—Sinking the joint winze on the Alpha line on the 2135-ft level is making good progress, the ore indications showing better as the sinking progresses. The south winze on the same level has reached the 2200-ft level of the Yellow Jacket, at which point a drift is being started to connect with the Justice line.

**SIERRA NEVADA.**—The prospecting operations on the 1700-ft level are being pushed ahead in every direction with encouraging appearances.

**HALE & NORCROSS.**—Owing to the necessity of putting

in a new lift pump below the 2000-ft station in the Savage and the clearing out of the water tanks 50 feet below the 2000-ft station in the Ifale and Norcross, no gain has been made upon the flow of water.

**UTAH.**—The north drift on the 1300-ft level is steadily advancing, the face in very favorable ground. The north drift on the 1150-ft level is in 445 feet, the face in porphyry.

**LADY WASHINGTON.**—The main drift east on the 850-ft level continues steadily advancing toward the ore vein. The face is in very favorable ledge matter and the increase of hot water seepage shows the ore vein to be not far off. The drift south on this level to connect with the 1000-ft level of the Justice is running in low-grade ore, giving assays of from \$15 to \$20 per ton.

**OTERMAN.**—The south drift on the 1400-ft level is making the best of progress, the face in very favorable quartz and ore. Sinking the winze below this level to prospect the ore vein in a downward direction is making good progress.

**CON. VIRGINIA.**—Sinking the main shaft below the 1300-ft level is being pushed forward with all possible vigor, the bottom in good blasting ground, and the flow of water giving no trouble whatever.

**CALCEDONIA.**—The air connection with the Overman on the 1400-ft level has been completed and much better ventilation obtained to that depth. The north drift and prospecting crosscuts on the 1000-ft level continue to show good prospects of ore.

**WARD.**—Sinking the shaft is making excellent progress, the shaft only lacking a few feet of having reached a depth of 1,000 feet. The rock in the bottom blasts well, and the flow of water gives no trouble.

**CROWN POINT.**—Daily yield, 50 tons of ore, keeping the Rhode Island mill steadily running. The east prospecting drift on the 2000-ft level is rapidly advancing, the face still in quartz, low grade ore and porphyry mixed.

**TRIOX.**—The ore yield is about 50 tons per day, and the Vivian mill is kept steadily running. The breasts and stops of the 350 and 240-ft levels are showing finely, and at the 350 the ore body is fully 40 feet wide, with evident extension to much greater depth.

**STURIO TUNNEL.**—Making very good advancement at present, though favorable working ground, consisting of ledge porphyry, with seams of quartz and clay. Total length of tunnel, 18,478 feet.

**LEVATHAN.**—Sinking the incline below the 600-ft level is making excellent progress, following the under side of the ledge, in the foot wall.

**NEW YORK.**—Sinking the shaft deeper is now in full progress.

**SOUTH COMSTOCK.**—The south drift on the 500-ft level is in 145 feet to-day. The face has changed to more of a clay formation, with increase of water seepage.

**BALTIMORE & AMERICAN FLAT.**—Driving the north drift on the 1400-ft level is making good progress, the face in quartz and vein matter of a fine character.

**WHITE LEAD.**—Face of main drift in ledge material, which works easy, allowing of good advancement.

**NORTH DAVENPORT.**—Plenty of low grade ore is developed by the drift, with occasional small streaks of good pay ore.

### BRISTOL DISTRICT.

**GREAT EASTERN.**—Pioche Record, Dec. 8: Three six-mule teams, loaded with supplies and hoisting works for the Great Eastern mine, left here Thursday morning. We understand this mine promises well, having quite a large body of ore already developed that will average \$80 per ton. As soon as the hoisting works are in place it is the intention of the Superintendent to commence shipping ore to Bullionville for reduction.

### EUREKA DISTRICT.

**METAMORPHS FURNACE.**—Eureka Sentinel, Nov. 8: Everything is moving along very smoothly at the Metamorphs works. The furnace is working like a charm, and the machinery runs without hitch or delay. The sample mill on the second floor is a model in its way and a wonderful help to the chemist. According to the sinking of the considerable outside ore is being reduced, and large quantities are arriving daily. On Wednesday last the furnaces turned out 167 bars, or a trifle over eight tons.

### ESMERALDA DISTRICT.

**PROMPT.**—Virginia Enterprise, Dec. 5: Geo. Daly, who arrived here yesterday from Aurora, gives a good account of the prospects of that place and Bodie. Mr. Daly is superintending the erection of works that are about to be put up for the purpose of thoroughly prospecting the old Real del Monte mine. He has graded a road some 2,000 feet in length from the town of Aurora to the point where operations are to be commenced; also, has graded a site for a shaft and shaft-house. The sinking of the shaft will be commenced to-morrow. A hoisting engine will arrive on the ground next Monday. All the necessary lumber and timbers will be sent out from Carson. About 30,000 feet of lumber will be required. The freight on this will be two and one-fourth cents per pound, and as it weighs about three pounds per foot the transportation alone will cost \$3,400.

The resumption of work on the Real del Monte mine has aroused the old settlers, and they are scouting out and prospecting in all directions among the hills.

On Thanksgiving Day a rich discovery was made by Zinc Barnes and others on Middle hill. The ledge found by them is six feet wide and assays from \$40 to \$300 on the croppings. In the early days a few rich little pockets of ore had been gouged out along the course of the vein, when it was abandoned.

### ELY DISTRICT.

**RAYMOND & ELY.**—Pioche Record, Dec. 8: Are going down incline on the winze from 1200-ft level, having reached a depth of 30 feet. The usual amount of low grade ore is being extracted from the upper levels; no change in other portions of the mine. Fifteen stamps of the mill have started crushing ore; expect to keep them going steadily.

**DAY MINE.**—All the works around this mine are being pushed to completion. Have been extracting ore and the work of hauling to the mills in Bullionville for reduction will commence on Monday next; teams will be kept going constantly between the mine and the mills hauling ore. The upper tunnel and incline are pretty near meeting.

**PIOCHE BULLION.**—\$14,543.88 in bullion was shipped by Wells, Fargo & Co. during the week.

### WHITE PINE DISTRICT.

**THE EBERHART MINE.**—White Pine News, Dec. 8: We are informed that quite a chamber of high grade ore is being opened out in the Eberhardt mine. This is an extension of the old one which was worked out last year. The present discovery has been followed by narrow streaks leading from the old chamber, and now the indications seem favorable for another large ore body in that direction. If such should prove to be the case, the company's mill could be run all next summer, regardless of the developments in the tunnel, and the mine be again placed on the list of the dividend paying. We believe that the Eberhardt & Aurora company has yet a future before it that will surpass in merit even the highest hopes of its most sanguine stockholders.

**THE HUNTER FURNACE RUN.**—Mr. Ellsworth Daggett, Superintendent of the Hunter Con. Co., was in town last Thursday. The furnace has closed down for the winter, after a successful run, which realized for the company \$71,000. The company's mines will continue to be worked all winter.

## Arizona.

**TURKEY CREEK.**—Arizona Enterprise, Dec. 1: Pat Hamilton is in Turkey creek. He reports good mining and milling prospects on the creek. Says that Master-son's mill blew its whistle a day or two ago and will start in crushing ore Tuesday or Wednesday next. W. Z. Kelly will run the mill. Dave Nagle has charge of the mine.

**ARIZONA.**—Through the politeness of the gentlemanly Superintendent, Mr. Gillet, I was enabled to make an examination of the Tip-top mine, and notwithstanding all the reports of the immense richness of its ores, was

(Continued on page 380.)



## Trees and Rainfall.

No. 4.

[Written for the Press by SAMUEL PURNELL.]

## Conditions in California.

The same monsoon that blows across the hot sands of Arizona, sweeps also over the Colorado and Mohave deserts, but for the same reasons that it could deposit no rain in Arizona it can deposit none in southern California. Moisture cannot be condensed from a wind that is cooler than the earth. The only summer rains that fall upon western Arizona or southern California are those locally denominated "cloud bursts," in which the rain, instead of falling gently, comes from the cloud as one sheet of water, and gives rise to mountain torrents that carry everything before them and add additional desolation to the country. "Cloud bursts" have their origin in electrical discharges, as the electrical discharge takes place instantly, so does the water fall from the clouds where it had been held in repulsion while somewhat cooled by the presence of high mountains. Accordingly we find "cloud bursts" are discharged upon mountains that overlook hot and sandy valleys. The reflected heat of the latter drives the clouds to the extreme point of the mountain, and, amid great electrical disturbance, sheets of water descend so suddenly and with such force that portions of the clouds are carried along. This water is from the South Atlantic, and the winds that brought it, being now almost completely deprived of moisture, are deflected by the Mohave mountains, and are not felt upon the coast or in the valleys of California and Oregon. The Pacific coast, receiving no summer rains from the great Atlantic current that waters all the country to the east, has only the winds of the Pacific ocean from which to hope for summer rains. That no summer rains fall in California, but that they fall in abundance in Oregon and farther north, is well known; it is not so well known why.

## The Wind

That blows upon the Pacific coast from May to October is called a "trade wind." A northern equatorial current of water strikes the coast of Asia near the Island of Formosa, is deflected north and northeast, forming the Japan current, or the Black stream. This gives off the Kamchatka current running up toward Behring's strait; but the main body crosses over toward Alaska, then runs south as the Pacific coast current, and off the coast of Mexico, into the equatorial circulation.

Accompanying this vast body of moving water is a strong wind, the north Pacific trade wind, which in Oregon blows from the north and in California from the north west. Blowing over a sea cooled by an Arctic current, saturated with moisture at as low a temperature as 55° F., its relative humidity is very low, containing but about four grains of water to the cubic foot of air, or only about one-third that possessed by the warm monsoon when it strikes the valley of the lower Mississippi. At this low temperature it strikes the coast of California, which is generally bare of trees, in many places sandy and heated up from 70° to 90°. The consequence is that as soon as the moist, cool wind strikes the heated land its temperature is elevated, its relative humidity is lowered, it relatively contains but half as much moisture, it can now absorb more water, and instead of being in a condition to impart moisture it will dry everything that it passes over. The summer trade wind can only be caused to deposit a portion of its moisture upon California by cooling it below its dew point, when it would probably deposit half its vapor before it reached the Sierras.

There is but one way to accomplish this, and that is by the planting and maintenance of forests upon the coast range of mountains, and covering all the valleys not absolutely needed for the sustenance of the people, with living grass and trees. As long as the present nakedness of the valleys and mountains of the coast continues there can be no hope for summer rains, and the interior of the State must, for the greater part of the year remain a barren and burning region.

## In Oregon

Summer rains frequently and regularly fall and are precipitated from the same trade wind that strikes the California coast, but Oregon offers conditions whereby the wind is cooled and its water falls. Western Oregon is densely wooded and to that fact is due the annual fall of 60 inches of rain or three times as much as the average of California. Western Oregon, in consequence of this rainfall, equally distributed throughout the year, has a far superior climate to, and is far more productive than any portion of California, and her great Willamette valley is a paradise when compared with hot and arid wastes of the interior of this State.

In Eastern Oregon the lofty Cascade mountains squeeze from the trade winds the balance of its precipitable moisture, and east of them Oregon has few or no forests, only a few inches of rain annually, and is in the generally barren condition of Nevada. North of Oregon the forests are still denser, the earth is still cooler and still more rain is thrown down. The rainfall, as to amount and time, upon the western coast of Mexico is substantially like that of southern California.

## Sun Spots and Rain.

As all terrestrial motion depends upon and is transmitted from the sun, it follows that more

or less activity of the sun will cause more or less activity in the motive powers at work upon the earth. After many years of observation in many parts of the globe, it has been determined that the activity and dynamic quality of the sun varies from year to year and in a cycle of about 11 years, and that this varied activity is coincident with an increase and diminution of sun spots. When the surface of the sun is thickly covered with spots, its potency is enormously magnified, and the solar forces which govern all terrestrial phenomena are correspondingly exalted. At such times great storms and cyclones sweep over the earth, free electricity is abundant, and the quantity of water evaporated from tropical seas by the electro-dynamic action of the sun is so large that the whole earth is well watered by copious rains. On the other hand, during the period of minimum sun spots, the dynamism of the solar envelope is greatly lessened and its influence upon the earth is correspondingly decreased. At such periods, the atmosphere is generally calm, ships sail through tranquil seas, hot weather prevails, and there is too little electricity in circulation to mechanically produce the great tropical evaporation necessary to water the earth; drowths then prevail.

This has been found to be invariably the case in India—a country most admirably fitted for meteorological exploration—where it has been definitely ascertained that years of drowth and famine correspond with those of minimum sun spots, and vice versa. Consequently, it has been possible to predict, approximately, the annual rainfall of India and its resulting plenteousness or famine. The same has been found to be true of the Cape of Good Hope, and of other places where systematic observations have been made, and it will be found true of all parts of the earth when science has encompassed it.

The whole scope of the power and influence of sun spots, or of that solar condition of which they are indicative—the learning of which, in fact, constitutes the new meteorology, and embraces all of the science that has any prophetic

this winter, yet in consideration of the paucity of sun spots and the absence of electro-dynamism the author, in accordance with the latest deductions of science, ventures to predict that the rainfall this winter will not vary much in quantity from that of the winter of 1876, when the rainfall at San Francisco was less than 10 inches, and that, consequently, another dry season upon the Pacific coast may be confidently anticipated.

## The Winter Rains

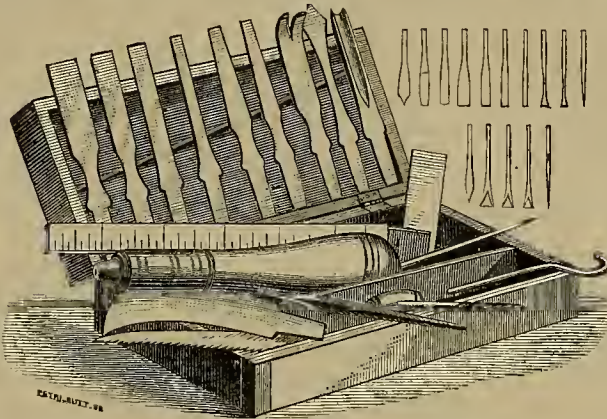
Of the Pacific coast need but little attention in this connection. They usually fall in ample volume, and equal in amount those of most fertile countries. The rain winds of winter come from the southwest; a warm ocean wind, saturated with moisture at a high temperature, and carrying three times more water than the summer winds. Being winter in the northern hemisphere the land is much cooler than in summer, much cooler than the southwest wind, and as that wind sweeps over the mountains it is cooled below its dew point and part of its moisture falls as rain. This is the case annually, and all parts of the State receive the baptism of water, whether naked or wooded. The amount of forest, however, has a great influence upon the amount of local rainfall; the Colorado desert and western Arizona receiving but about three inches; the vicinity of San Diego, 10 inches; San Francisco, 21 inches; Humboldt bay, 34 inches; while the forested Sierras receive the copious drenching of from four to six feet of water.

It is not the want of winter rains, but the absolute dearth of summer rains that renders so large a part of the Pacific coast barren and inhospitable, and which, if not remedied by the wisdom and labor of man, will for many centuries in advance maintain a hot and arid waste over a portion of the earth that is capable of being converted by summer showers into a paradisaean region of plenty and delight.

## The human

## History of California

Reaches back but three centuries, and its testi-



A HANDY FAMILY TOOL CHEST.

value or stable foundation—is not yet entirely understood, as the determination of their effect is quite recent, and profound investigations are still in progress; but enough is already known to affirm in the strongest manner that the number and volume of sun spots is an indication and prophecy of mild or intense solar disturbance and potency, to every variation of which the earth immediately responds, and as the volume of the sun spots increases toward the middle of the cycle so do the terrestrial forces increase and ultimate in tempests, electric storms, and especially in that great equatorial evaporation that brings copious rains upon the earth at large.

While the total amount of moisture falling upon the earth during a season is gauged quite accurately by the sun spots, yet the rainfall of any particular country during any particular year is modified by continental and cosmical influences at present but imperfectly understood, as sometimes under a minimum of sun spots a country receives more rainfall than upon the average, and vice versa, the rain not being distributed strictly as the aspect of the sun would appear to indicate; still the rule is surely ascertained, and the general quantity of rainfall can be now confidently predicted far in advance of its coming, and to a certain extent the probable local rainfall of any particular country.

By reference to a chart it will be seen that the dearth of the winter rainfall of California since 1849 appears to have been dominated by the 11-year periods, and by the solar potency immediately preceding and succeeding the cycle years. Although locally it has received heavy rainfalls in certain years that do not appear to correspond with the solar disturbance, the reasons for which can at present be only surmised, yet it appears certain that the amount of rainfall has generally been relative to the number and magnitude of the sun spots. The year 1876 was the close of a cycle, and was one of a minimum of sun spots. Drowths occurred in India, Southern Africa, Australia, the Pacific coast of America, and especially in California. The solar aspect during the present fall, that of 1877, is much like that of 1876, the sun now being but slightly more spotted than then, and averaging but about one-tenth the maximum sun spot area. While influences and modifiers, of which we are at present in almost complete ignorance, may materially vary up or down the totality of the rainfall upon this coast during

remedy the evil. Small groves of trees are disappearing, the water in the wells must be sought deeper, the artesian wells flow less, the winters have less rain, but little snow falls upon the mountains or long remains, great river beds are seen through which small brooks do not now run, and the climate in summer upon the deserts possesses an average temperature of 100° to 114°, equal to that of the great Sahara, and much hotter than that of India, Persia and the Red Sea. The evaporation of southern and central California in summer equals one-quarter of an inch in 24 hours. The annual evaporation would amount to 95 inches, or equal to that of the Dead Sea. Were the entire flow of the Colorado river turned into the desert, it would all be evaporated from a lake of 556 square miles of surface. At a few hundred feet from an interior river, its influence in raising the average humidity is not perceptible, so quickly is the vapor diffused into the surrounding air.

## Amateur Carpentry.

There are very few men, either young or old, who cannot do a very useful and very satisfactory little job of home carpentry if they have a few tools fitted for it. There are a hundred little things a month which may be either made or repaired, and thus made to minister to convenience and comfort. They are often too small to call in the practical mechanic, and unless the amateur can encompass the need there is often a loss of both money and enjoyment. More than this there is an ever present advantage to the young man who early learns the use of a few simple tools, and there is a never ending gratification in the well-doing of a job to one who has once tasted the satisfaction of the mechanic's achievements. The economy of home carpentry; the instruction of the young in the use of tools, and the gratification of all who have tastes for mechanism, are all made more attainable by the very compact and yet comprehensive sets of small tools which are contrived by our tool makers. We had one of these sets of an early pattern 20 years ago, and, though since that time, we have gone through an apprenticeship at the hench and the lathe, we still find a set of the modern improved amateur tools of constant service to us in our little home mechanics.

These remarks, drawn from our own experience, are called out by the engraving on this page representing a little "Family Tool Chest," which we have used to good advantage. It is one of many styles of low-priced tool chests sold by Dunham, Carrigan & Co., of Front street, S. F. One of them would be a far better Christmas present for a boy or young man than all the useless things which are brought forward at holiday time. Nor are they exclusively for young men. We have a good lady at our house who can use the contents of the little chest as handily as she does her sewing machine when a little woodwork in the house or in the garden, needs immediate attention. We have no doubt that many of our readers will find styles of these useful chests to please them in the interesting circular issued by the firm we have named above.

**MINING SUIT.**—The Keystone mining company has entered suit in the First Judicial District Court of Nevada, praying that the tax title under which the Lady Washington mining company lays claim to the Keystone ground, be declared invalid. The complaint sets forth that the plaintiff is incorporated under the laws of the State of California; that the defendant is also incorporated under the same laws; that since March 2d, 1874, plaintiff has been the owner of and in peaceable possession of the mining ground (which is 1,200 feet in length), known as the Keystone company's claim; that subsequent to the acquisition of said ground by said plaintiff, the defendants claim to have acquired a right and title to the premises of plaintiff by purchase at a tax sale by the Town Marshal of Gold Hill; and that defendants claim solely under a deed executed by said Town Marshal of Gold Hill. Wherefore plaintiff prays that judgment be entered in favor of plaintiff, declaring and establishing its title and estate to the premises above described to be valid and absolute, and that the title claimed by the defendants be declared invalid.

**OLD RAILS AS BRIDGE MATERIAL.**—We read in the Railroad Gazette that a new use for old rails is suggested by two Austrian engineers, who have published a book containing designs of bridges and other framework constructed almost wholly from old rails, the connections being sometimes made by means of other rolled iron shapes and sometimes by bolts and rivets. At present prices, it is said that the structures of old rails are 27 to 30 per cent. cheaper than equivalent structures of ordinary forms. Holes in rails used for such purposes must be drilled and not punched, and this increases the expense somewhat, but it is claimed that the rails are worth much more for such purposes than for re-rolling, and that they are very good shapes for use in structures, when properly used. It does not appear from what we see said of the book whether the authors have actually made any bridges of old rails.

THE attempt to introduce dummy engines of the kind used in Philadelphia upon the Cincinnati street railroads has been abandoned.



## Home Industries.

## The Manufacture of Kid Gloves.

We always welcome with pleasure any new enterprise brought into this great and wide-spread land, especially when it makes its first appearance in a part of the country where we are most interested. Of late years, for the sake of deriving larger profits and to obtain new and undeveloped fields of operation, foreign manufacturers have found it to their interest, either by establishing agencies of their respective products, to supply the demand of this great nation for all kinds of articles of comfort and luxury in a direct and unrestricted way, or by becoming members of our society themselves and moving over into our country with all the necessary outfit, assistance, machinery, etc., to commence right in our midst to produce and manufacture such goods as they had been accustomed to bring upon the market, perhaps, for many years previous; in the manufacture of which article they had acquired especial ability, proficiency and reputation, thus reaping at once a greater return for their experience, skill and industry, and thus on the other hand supplying the demand among us more directly, more economically and otherwise more advantageously. It would be difficult and out of place here to enumerate the many industries that gradually find introduction among us. May we only hope they will still increase and continue to come to us, to their introducers and to our own advantage.

To many the manufacture of the kid glove, the subject of our present consideration, would seem to be in a great sense unimportant, useless and a waste of time; for, especially in this part of the country, how many are there who never have any occasion whatever to use such an article. They would no more buy a kid glove than they would be apt to fly, no more think of using such a thing than others again would think of going without it. Thus it is curious to observe the difference of opinion on this one article of luxury, unimportant in the view of so many and yet of such vast and indispensable importance in the eyes of yet a greater class who favor it, buy it and use it.

For the interest of both classes concerned, those whose daily avocation makes it needless to use a glove—except upon some rare and exceptional occasion—and those who are so placed as to have a more frequent or a continued occasion for its wear, we desire to call the attention to a new manufacture of kid gloves that has only just sprung up among us; the one of Salmon Israel, Esq., from Paris, at 119 Sutter street, between Kearny and Montgomery. This industry, novel and interesting alike, promises to be well received, and to bring to its proprietor and to the community at large the various advantages and points of interest previously referred to. The establishment is headed by Mr. Israel in person, and though his time seems to be well occupied, he was so courteous as to give the following various points of interest:

There are a few leading manufacturers of gloves in France, with whose names the American market has become sufficiently familiar, as they represent the Jouvins, Preville, Alexandre, Drefousse and other establishments. These names originally were a guarantee for a good quality throughout, but of late many spurious articles and imitations have been palmed off with similar stamps and names. The glove at present of greatest estimate in the French capital bears the name of the "Lavallier" glove, not the name of the manufacturer, but called so after an actress, who was the first to introduce this special patent and original style of kid glove. It is claimed to possess various apparent advantages over anything else ever produced in this line, and principally on account of being manufactured of only the very best and therefore most durable material.

Having full experience as to the value of these points, and observing this opportunity of introducing such a genuine article to advantage in this wide community, Mr. Israel undertook at once to remove into our midst and to supply the public demand direct and with accustomed care, with what he has been producing to so great an advantage at home. To make success a certainty he brought with him the whole outfit entire; the stock, in finest quality and greatest variety; interesting machines for cutting this pattern in less than a minute, which, together with their pressing apparatus, represents many thousands of dollars of capital; furthermore a number of peculiar kind of sewing machines differing materially from those commonly in use, to sew the side and only seam of the glove in a most delicate and accurate way. These machines are also estimated to be of great value, as they are with the other, the only one in this country. There are a great number of French Demoiselles busily engaged in the cutting, sewing and finishing of the many gloves that are ordered continually. These assistants all having been brought over from France to complete the successful working of the enterprises. Thus the house is prepared to do a great amount of work and can easily turn out hundreds of pairs of gloves in a day, completing any individual order in two hours time only. Other advantages are that gloves can be made to order to match any special color of dress, with two, three, four, up to twenty-five buttons, according to order, and as the hand is measured, the fit ultimately is very perfect and ex-

act. We would especially call attention to this fact that those who may have, by nature or accident, any peculiar shape or form of hand can have gloves fitted as smoothly as in other cases, thus making them more ornamental and at the same time more easy and agreeable to be put on.

This new industry will be alike pleasing and interesting to all who may have occasion to inspect it, and, after close examination, to patronize it, when occasion permits; for the fact of being able to see all things clearly with your own eyes, and have the whole process of manufacturing explained in all its detail on the spot is sufficient to inspire one with confidence in the product.

## USEFUL INFORMATION.

## How Oil Cloth is Made.

The *Polytechnic Review* has been looking into the manufacture of oil cloth, and from the results of its investigations we take a general description of the process, which we believe will be interesting to all readers: The oil cloth, so called, as used for floor covering, consists of strong jute cloth, ("burlap") covered with mineral colors ground in oil. The burlaps weigh from 9 ounces to 12 ounces per square yard. Their open texture must be filled up, and a smooth, heavy ground color put on before the reception of the pattern. For best quality goods, from six to eight coats of ochre and whiting, ground in linseed oil, are applied. The cloth for third quality goods is "starched" with a glue size as a priming coat, receiving afterward several coats of oil color. The "painting machine" is primitive in construction, but rapid and effectual in operation; it is used for either starching or grounding with oil. The 50-yard roll is attached by hooks to the base of a wooden triangle, and a rope attached to the apex of the triangle drags the roll through the painter and along a drying rack. The paint is applied with a dipper, and is spread by the cloth passing between an oil cloth cushion and a steel knife edge, slanting in the direction of motion. Fifty lineal yards a minute can be printed; in all from 8,000 to 10,000 yards in the various grades are daily printed in the whole establishment. After each of the first four coats of oil color, the goods must be "shaved," as the fibers of burlap make the surface somewhat fuzzy and uneven. The "shaving" machine has a table over which the cloth is passed, lightly stretched, while two bars, each bearing two pumice stone "bricks" (or more according to width), scrub the surface with a longitudinal and traversing motion, imitating hand-scrubbing. The pumice stone rubbing gives a fine, even surface; and after the last ground coat, the pattern or color blocks may be applied. The blocks employed in printing are similar to those used in wall-paper printing, being maple blocks, one cut for each color. These blocks are either in peg-work, line-work or rule work. The first are made by sawing the blocks lengthwise and crosswise with a circular saw (leaving square "pegs" projecting), and then cutting away those portions not intended to print. The line work has its design in parallel lines only. The brass or copper blocks have the design traced in the flat block, and then sharp brass rules driven into the required outlines. Peg-work is repaired by driving in copper wire cut square at one end and sharp at the other. Line-work is repaired by brass rules driven in. The felt filling used between the rules of some wall-paper blocks is not here employed, as preventing proper impression. For mat-work the block embraces one-fourth of the pattern, and must be of such a character as to admit being turned to print successive corner quarters. After all the single color impressions have been given, one block, called the "masher," which has no color applied to it, and which has on it the whole pattern, is applied, and given a strong impression. After printing, drying is in order, and should last at least 10 days. The older oil cloth is, the better, as the paint hardens. "Dryers" injuriously affect the linseed oil; air drying is preferable, but the American market cannot afford it. In England, a piece of oil cloth is frequently six months in making; here it is generally but 30 days. The heat is graduated to 130° F., running up from 90°. The principal pigments employed are vermilion, drop black, Venetian red, Sienna, chrome yellow, whits lead and umbers. After printing and drying, varnishing is in order, copal varnish being sprinkled on the roll and distributed by two vibrating arms, each bearing five soft bristles. The roll is handled by means of the triangle and drag rope, and hauled through and into the drying racks.

## Tests of Quality in Watchmakers' Oils.

A long article on watchmakers' oils is given in the German *Watchmakers' Journal*. It shows that evil effects follow the oxidation of the oil (or rancidity) and gives tests to detect this state. We quote a few points: The organs of taste and smell are insufficient to ascertain what degree of inclination an oil has to become rancid, or even to indicate at once when it has actually become so. The following method will answer this purpose: Pour the oil in a bottle, together with an equal quantity of water, in which soda (carbonic sodium) has been dissolved; then shake it violently and let the mixture stand for some hours. If the two liquids separate perfectly, particularly under a higher temperature, it is a proof that the oil is free from

acid. On the contrary if a white substance shows itself between the two, it is certain that acid is present. Another method is based on the great sensibility of litmus paper in regard to acids. Litmus paper can be bought at the chemist's. Acids which have become free in an oil, will change blue litmus paper into violet or even red, according to the strength of it.

Many think that the clearer an oil the better it is. This is a decided mistake. A bad color certainly indicates impurities, but if colorless or yellow it is in this respect immaterial. In fact, those very clear oils are generally the most apt to become rancid, because the methods employed for the clearing process tend mostly to forward oxidation. To test the fluidity of oils by letting different sorts run off an inclined plane is also a doubtful experiment. Not only are there oils so poor in body that they flow too freely, and do not give the required protection against friction, like the sesame oil, but many other obstacles—scarcely observable with the naked eye—such as a slight unevenness in the surface of the plane may influence this trial. A far more reliable way of ascertaining the desired degree of fluidity is to saturate a strip of blotting paper with the oil, and watch whether the drops will fall off in pearls, or show an inclination to spread out. The latter is a certain sign of a viscid oil.

**CURLING OSTRICH PLUMES.**—A correspondent of the *Inter-Ocean* says: If possible, an old plume should be used to practice on until one gets her "hand in," as two or three broken feathers in a nice plume might spoil it. With the left thumb and forefinger hold that part of the quill to which the feathers being curled are attached, and with a rather dull but pointed penknife take up the slender feathers, one at a time, beginning at the base of the plume and working toward the point. This pointed blade will enable one to pick up the feathers readily; then, with a quick movement, acquired only by practice, the blade and thumb between which the feathers are held are to be drawn to and off the end of the feather, when it will curl back toward the quill, more or less according to how tightly it was held while being drawn between the thumb and knife. If it is only desired to curl the tip end, as in long plumes, it is best to hold part of the way down the vane, instead of holding the quill. Patient practice will enable one to curl plumes nicely within a reasonable time and their added beauty will repay the trouble.

**BUTTER PACKING FOR TRANSPORTATION.**—At the commencement of the present century, Appert devised his well-known method of "hotting" butter. It answered admirably, but for some reason or other has completely fallen into disuse. Then M. Beon adopted the plan of covering butter packed in tins with a thin layer of water acidulated with tartaric acid, or with a solution of six grammes of tartaric acid and the same quantity of bicarbonate of soda in a liter of water, and soldering up the cases. This process, too, gave excellent results, and is still practiced by some large houses in Italy and by the Grand Compagnie de Copenhague.

## GOOD HEALTH.

## Danger in Damp Houses.

A writer in the English journal, *Public Health*, has the following points which should be borne in mind by all home makers: It is a common notion that the country is more healthy than the town, and we readily grant that, in the elements of pure air and quiet, the country has advantages; but it is not true to affirm that the country is *always* the healthiest. As Dr. Bartlett says, if old residents rebuild his house, he does so on the old site, for the sake of association or more urgent motives. The site may be marshy, always saturated, or badly drained; yet it is considered preferable by the old occupant. Again, the city merchant who retires into the country selects a secluded spot, surrounded by trees; it may be badly drained but being in the country, it is considered above suspicion—on sanitary grounds, at all events. If a homestead is contemplated, the farm buildings will be placed close to the house, and the farm-yard so near the window that the effluvia of the manure is constantly the evil to be borne, if not grumbled at. All that affects the substratum, the drainage of the soil and the position of the house, is too generally disregarded, in the idea of enjoying country air. The proximity of a farm house is even, by some people, imagined to be conducive to health, so singularly ignorant of sanitary laws are they. Most country cottages have pig-sties, and the floors of these are a prolific source of nuisance; but occupants are under the impression that the unpleasant and pungent smell that is engendered is not harmful. In fact, it is strange to find that a country air strongly and constantly diluted with noxious gases is believed by many to be healthier than a town air free from these nuisances. But land-drainage is, perhaps, even more a source of unsanitariness in country districts. In 1852 a sanitary report was published, in which certain propositions were laid down, showing that "excess of moisture, even on lands not evidently wet, is a cause of fogs and damps;" that "dampness serves as the medium of conveyance for any decomposing matter that may be evolved, and adds to the injurious effect of such matter in the air; in other words, the ex-

cess of moisture may be said to increase or aggravate success of impurities in the atmosphere;" that "the evaporation of the surplus moisture lowers temperature, produces chills, and creates or aggravates the sudden, injurious changes of temperature by which health is injured." Now these propositions have reference to conditions that exist more largely in rural than town districts. Malarial disease, tuberculous consumption, typhoid fever, and various other functional diseases, are well known to spring from a high level of ground-saturation. Wherever this condition of ground moisture has been reduced by artificial means, these types of disease have been found to diminish in their intensity; and it is chiefly by the mists generated by this constant dampness that we must account for the aggravation of the symptoms in those maladies. It is a fact that the most fertile soils are those which give rise to zymotic diseases, while those of sand, chalk or gravel, and of a porous quality, are the healthiest.

## NEW THERAPEUTIC USE OF EUCALYPTUS.

The growth of eucalyptus in this State has become so general that we feel sure that all news of use and virtue in the tree will be read with interest. In his "Clinical Studies," Sir John Rose Cornack makes some remarks upon a therapeutical agent, the eucalyptus globulus. In simple uterine catarrh, Sir John Rose Cornack says that he does not know of any remedy equal in value to preparations of this plant. "In such cases," he continues. "I have several times, with most satisfactory results, simultaneously administered them by the stomach and in the form of injections. As Guhrer has shown, the anti-catarrhal virtues of eucalyptus are most remarkable. With increasing experience of its power, I more and more employ in bronchial, vesical and uterine catarrh, in gonorrhoea and in gleet." An infusion (one-half oz. to two pints), or a tincture (one oz. to one pint of rectified spirits) of the leaves, or the essential oil given in capsules, are the preparations ordinarily employed. As a gargle or vaginal injection, and for external application, the infusion or the tincture diluted (one drachm to six or eight ounces of cold or tepid water) may be used. Besides these therapeutic uses of the eucalyptus, the author adds his very favorable experience of its remarkable power of destroying the fetid odor of morbid discharges without the substitution of another unpleasant smell. He speaks from an extensive trial of eucalyptus lotions in horrible offensive discharges in cases of ozena, cancer of the tongue and throat, cancer of the uterus, gangrene, and other affections attended by fetor.

## RESTORING THE DROWNING.—The New York

*Tribune* describes an instrument devised by M. Woillez for resuscitating asphyxiated persons, and particularly those who have been in danger of death by drowning, is claimed to be superior to all other methods or appliances employed for such purposes. It consists of a sheet iron cylinder, large enough to receive the body of an adult person. This cylinder is enclosed at one end and the body of the patient inserted, feet foremost, at the open end, up to the neck, around which a diaphragm is placed in such a manner as to prevent air from entering the cylinder. An air pump is then set to work; the air is drawn off from the cylinders with the result of causing a partial vacuum, when the outer air, by its weight, forces itself into the lungs through the mouth and nostrils, which are exposed to the external air; by an opposite action of the pump the air is allowed to re-enter the cylinder, and respiration is thereby initiated. A glass plate inserted in the cylinder enables the operator to watch the movements of the chest, which rises and falls as in life, with the alternate working of the pump; these may be repeated about 18 times a minute, an exact imitation of natural breathing is thereby effected.

CARBOLATED CAMPHOR.—In the *Bulletin de*

*Therapeutique*, M. Soulez describes the new preparation known as carbolated camphor, now becoming quite popular in European medical practice on account of its tendency to produce diminution of re-action after severe operations, cessation or amelioration of pain and less abundant suppuration. It is made by dissolving 2.5 grams of powdered camphor in one gram of carbolic acid, a solution of the strength of nine grains in one grain of alcohol—the solution being of an oleaginous, pale yellow, smelling slightly of camphor, but having none of the disagreeable odor of carbolic acid. It boils at a slightly elevated temperature, without decomposing, and also by the addition of concentrated alcohol, which throws down the camphor in crystals; similarly if a boiling solution of carbolated camphor is poured into cold water it instantly solidifies. It is miscible in all proportions with olive and almond oils. Chemical examination shows that the carbolic acid and camphor are not altered, and that they preserve all their properties in the solution.

## CONSOLATION FROM STATISTICS.—"And it is

really true that I shall recover!" asked a patient of his doctor. "Infinitely," answered the man of medicine, taking from his pocket a paper full of figures. "Here, look at the statistics of your case; you will find that one percent of those attacked with your malady are cured." "Well?" said the sick man, in a disinterested manner. "Well, you are the hundredth person with this disease that I have had under my care, and the first 99 are all dead."



# MINING SCIENTIFIC PRESS

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THE ORIGINAL ARTICLES in this paper are mostly set in solid type, giving in our columns one-third more reading than is contained in ordinary leaded matter.

Our latest forms go to press on Thursday evening.

SAN FRANCISCO:

Saturday Morning, Dec. 15, 1877.

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## NEW ADVERTISEMENTS.

Assessment Notice—Summit Mining Co.

## The Week.

The past week has, like several preceding ones, been a disappointment with regard to the important question of rain, in which not only the miners and farmers but the whole community are vitally interested. Several times the clouds have banked up to the southward with every indication of rain, but the wind has invariably veered round to the northward and dispelled the clouds. It is not yet too late, however, for bounteous showers, and we can only hope that they will come quickly, be abundant and last a long time. A good heavy rainstorm would stimulate business of all kinds.

The Legislature will hardly settle down to vigorous work until after the appointment of a United States Senator, with which, as we write, the members are engaged. A number of bills have been introduced, but there has been little discussion as yet. We give an abstract of the Governor's message in another column.

Important news comes to us from the seat of war in Europe in the announcement of the fall of Plevna. This is a great victory for the Russians, the Turks, however, only yielding when starvation stared them in the face, and even then after desperate resistance.

The principal events of the week in mining circles is in connection with the Justice mine investigation, referred to elsewhere. It seems an unusually aggravated specimen of mismanagement, as far as present developments show. The Legislature, if it follows the advice of Governor Irwin, will take up the question of mining incorporations and mining stocks, and it is to be hoped that some radical reforms will be inaugurated.

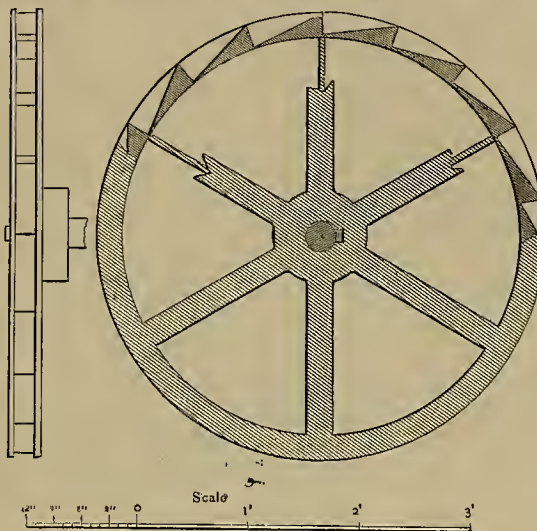
ACCORDING to the returns of the Keeper of Mining Records, upward of £70,000,000 worth of mineral wealth was raised in Great Britain and Ireland during the year 1876.

SHOT CREEK, Kansas, says she has produced 19,000,000 pounds of lead since the first mineral was discovered there.

THE New York coal companies have advanced the price of coal from 30 to 50 cents on the ton.

## Looking after Mine Managers.

Some Eastern capitalists who invested in Utah mining property and did not realize the profits they expected, have gone after the resident manager of the companies, and are about overhauling him in the courts. Associated Press dispatches from Salt Lake state that 11 cases were brought in the District Court last week against Liberty E. Holden, formerly of Cleveland, Ohio, and four corporation defendants, by stockholders residing in Cleveland and Toledo, Ohio, and Detroit and Kalamazoo, Michigan. The suits involve the title and produce of a group of valuable mines in Bingham, Utah, known as the "Old Telegraph" mines. It is stated that Holden has realized from the working of these mines during the last 18 months over \$1,000,000. The actions are brought to rescind pretended purchases of stock from Eastern stockholders by Holden while he was acting as general manager of the companies, based upon alleged suppression of knowledge of the fact that the mines were largely productive, and the further fact of his misappropriation of



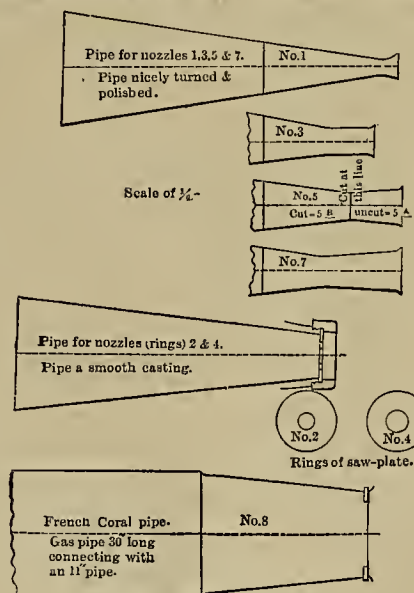
HURDY GURDY WHEEL.

large sums of money. It is claimed that the nominal sums of money paid to stockholders, on alleged purchases of the stock, belonged to them as dividends.

We know nothing whatever of the merits of the charges made, but feel called upon to deplore the fact that so many loose transactions are continually occurring in which the managers of mines are compromised, and the stockholders are the losers. In the case of Eastern or foreign investors delinquencies of this kind seem even more serious than in other cases, for

walk. When a fire breaks out the ladder may be unrolled by drawing it down with this chain. One or two men can then ascend to the roof to attend to the reel. Two hooks are attached to the lower end of the ladder, to which the hose can be attached and drawn to the roof. The ladder can then be used in the ordinary way. At the trial the other day a block was hooked on to the attachment on the cornice and the hose drawn up by a rope, the men going up the ladder.

It is intended that on all large buildings there



PIPES FOR NOZZLES.

the reason that such people are the very ones we desire to invest in mining property on this coast. So many good mines are lying idle for the want of capital to properly develop them that it seems a pity that the bad management or dishonesty of a few men should have the effect of deterring hundreds of persons from investing here. Every instance of this kind which comes to light has a bad effect on the company involved, and on the whole community.

We should like to see all delinquents in official positions in mining companies severely punished, both by fine and imprisonment. Put them in jail for obtaining money under false pretenses or conspiring to defraud. Three men in this city have just been held to answer to these charges in the Exchequer mine case, and if more frequent examples were made it would be better in every way for the community.

## Hammon's Patent Fire Escape.

We witnessed, on Wednesday, an exhibition of Hammon's patent fire escape, at the Russ house, on Pine street. This improved fire escape is intended as a permanent fixture on large buildings, so that the fire department, on their arrival at the building, can go immediately to the roof, or any story of the building, with their hose. It is used also for taking persons from burning buildings and for removing valuable property.

The escape is very simple in construction and operation. It consists of a ladder made of wire rope, with rounds made of gas pipe, through which run hars of wrought iron. This ladder is attached to a reel placed on the roof, a short distance back from the cornice. On the edge of the building is a small frame holding two pulleys, over which the ropes of the ladder travel. The ladder is kept rolled up on the reel when not in use, but a light chain is attached to the end and reaches down the side of the building to within a few feet of the side-

## HYDRAULIC MINING IN CALIFORNIA.\*

No. 10.

[By AUG. J. BOWIE, JR., A. B., Mining Engineer.]

## Experiments with Hurdy-Gurdy Wheel at North Bloomfield.†

As the hurdy-gurdy wheel is the outgrowth of hydraulic mining, the following table showing its efficiency may be interesting.

The wheel was 18 feet in diameter on outside, and 17 feet 4 inches in diameter to inner line of buckets (17 feet 8 inches in diameter at center line of buckets). The buckets were four inches deep, with flanges on each side.

The work done was measured by a Prony dynamometer, carefully made.

The head given shows the *real* head in feet at the point of discharge; that is, the head due to a discharge from a pipe of infinite size.

Description of Nozzle.	Diameter of nozzle in feet.	Head in feet at nozzle.	Discharge of water per second in cubic feet.	Velocity of water due to gravity.	Actual velocity of water at smallest diameter of nozzle.	Speed of wheel at center of buckets when running light.	Highest horse-power developed.	Ratio of work done to theoretical power of water.	Speed of wheel at center of buckets when giving most work.	Number of nozzles.
Nozzle tapered.....	.0531	322.8	322.14	146.8	82.8	3.8	3.18	48.8	1	
Ring.....	.0597	316.8	280.14	86.7	76.4	2.7	4.8	44.8	2	
Nozzle tapered.....	.0550	312.1	759.14	133.7	88.6	11.7	4.87	57.1	3	
Ring.....	.0547	312.2	551.14	90.7	7.5	4.14	54.7	4	4	
Nozzle.....	.0530	314.4	509.14	90.3	9.4	11.8	4.77	57.6	5	
Ring.....	.0531	314.4	774.14	133.4	13.5	13.5	5.87	59.8	6	
Nozzle tapered.....	.0531	312.1	1110.14	133.7	13.5	13.5	5.87	59.8	7	
Nozzle.....	.0531	312.1	1110.14	133.7	13.5	13.5	5.87	59.8	8	
Nozzle tapered.....	.0531	312.1	1110.14	133.7	13.5	13.5	5.87	59.8	9	
Nozzle.....	.0531	312.1	1110.14	133.7	13.5	13.5	5.87	59.8	10	
Nozzle tapered.....	.0531	312.1	1110.14	133.7	13.5	13.5	5.87	59.8	11	
Nozzle.....	.0531	312.1	1110.14	133.7	13.5	13.5	5.87	59.8	12	
Nozzle tapered.....	.0531	312.1	1110.14	133.7	13.5	13.5	5.87	59.8	13	
Nozzle.....	.0531	312.1	1110.14	133.7	13.5	13.5	5.87	59.8	14	
Nozzle tapered.....	.0531	312.1	1110.14	133.7	13.5	13.5	5.87	59.8	15	
Nozzle.....	.0531	312.1	1110.14	133.7	13.5	13.5	5.87	59.8	16	
Nozzle tapered.....	.0531	312.1	1110.14	133.7	13.5	13.5	5.87	59.8	17	
Nozzle.....	.0531	312.1	1110.14	133.7	13.5	13.5	5.87	59.8	18	
Nozzle tapered.....	.0531	312.1	1110.14	133.7	13.5	13.5	5.87	59.8	19	
Nozzle.....	.0531	312.1	1110.14	133.7	13.5	13.5	5.87	59.8	20	

An experiment at the Empire mill, French Corral, was made under the following circumstances, giving the annexed results.

Ten stamps, weight of each, 693½ pounds. Drop, .768 feet. Speed of stamps, 62.2 drops per minute. Work done by 91.68 cubic feet of water per minute. Head, 130.1 feet. Size of wheel, 13½ feet outer diameter. Diameter of wheel, 12.53 feet to centers of buckets. Size of buckets, four inches wide and six inches deep, set 10 inches apart. Water conducted to wheel through an 11-inch pipe 866 feet long. The wheel was direct on the cam shaft, single cams used. The mill crushed 60 tons of gravel in 24 hours; one-quarter inch screens used.

Description of nozzle.	Diameter of nozzle in feet.	Head in feet at nozzle.	Discharge of water per second in cubic feet.	Velocity of water due to gravity.	Actual velocity of water at smallest diameter of nozzle.	Speed of wheel at center of buckets when running light.	Highest horse-power developed.	Ratio of work done to theoretical power of water.	Speed of wheel at center of buckets when giving most work.	Number of nozzles.
Ring.....	.1823	130.1	1,528	91.4	58.5	10.0	4.45	41.0	8	

The head at French Corral was the height of the water in pen stock above the nozzle, no allowance being made, as was the case in the Bloomfield experiments, for loss of head by friction in pipes and some leakage.

## Statistics of Yield of Gravel Fields.

Statistics showing the quantity of material washed and the corresponding yield in gold are rare, difficult to obtain, and, for the most part, unreliable. This is due, principally, to the fact that in the early days of placer mining in California, the question to be solved by the miner was not what the gravel would yield per cubic yard, and what it would cost to move it, but rather how many ounces of gold dust he could "pan out" or "rock out" between sunrise and sunset. All that he required was that the daily yield in dust should exceed the cost of living, etc. When it fell below this he moved his camp to other grounds.

The wonderful productions of the river bars and shallow placers attested by the early gold bullion and dust shipments from this State, created an extravagance usual to all new and rich mining countries, the baneful effects of which are still visible. Gold in such profusion is no longer found so conveniently scattered. The introduction of hydraulic mining requiring the assistance of capital has inaugurated a new era in gravel washing. Hence all data of the yield and costs of working gold bearing surface deposits become valuable, and accordingly the following tables have been added:

\* A paper read before the American Institute of Mining Engineers of the Wilkes-Barre meeting, May, 1877.

† These experiments were made at the N. B. G. M. company's works by Hamilton Smith, Jr., C. E., and as they are the only experiments of the kind made with the hurdy-gurdy wheel, they are here given.



Table No. 1.—Showing the Yield of Gravel Per Cubic Yard at Various Hydraulic Claims.

NAME OF CLAIM.	LOCATION	NUMBER CUBIC YARDS WASHED.	GROSS YIELD.	YIELD PER CUBIC YARD.	HEIGHT OF BANKS FEET.	AUTHORITY.	REMARKS.
American Co.	Sebastopol, Nevada Co.	5,171,834	81,241,240 30	\$0 24	120	Hamilton Smith, Jr.	
Blue Tent.	Nevada County.	5,138,150	750,000 00	15		Raymond's Rep., 1874.	Estimated by several engineers, Ray. Rept., 1874, p. 10.
Eastground, Dry Creek.	Shasta County.	50,000	0,000 00	18		Raymond's Rep., 1874.	
Westside, Dry Creek.	Shasta County.	2,000	741 20	37		Raymond's Rep., 1874.	
Pietly Hill.	Shasta County.	1,333	22,000 00	10 50	30	W. K. Conger.	Raymond's Rep., 1874.
Dry Creek.	Shasta County.	170,000 00	1,700,000 00	10 25	70	Raymond's Rep., 1875.	Calculated from data, p. 84.
Whitesides Mine.	El Dorado County.	97,221	100,000 00	9 50	4	Raymond's Rep., 1875.	Calculated from data, p. 84.
Spanish Mine.	El Dorado County.	1,422	13,000 00	5 00	30	Raymond's Rep., 1875.	Calculated from data, p. 84.
Nagler Claim.	El Dorado County.	20,000	100,000 00	5 00		Raymond's Rep., 1875.	Gravel worked in a mill. Cubic yards estimated from coarse dirt in cars, p. 100.
Indiana Hill.	Placer County.	14,738	75,422 47	5 20		Raymond's Rep., 1875.	Deep placer mining; gravel extracted and then sluiced. Cubic yards estimated from coarse dirt.
Bald Mountain Co.	Sierra County.	115,950	323,352 38	2 83		Raymond's Rep., 1875.	From June 24, '75 to June 24, '76, 100,000 car loads of gravel were mined; stripping 300,240 superficial ft. of bedrock. Each car contained 1 cu. yd. loose gravel, 1 cu. yd. gravel in place.
Bald Mountain Co.	Sierra County.	30,040	296,737 28	5 08		H. W. Wallace.	From June 24, '76 to June 24, '77, 08,044 car loads extracted; stripping 343,768 superficial ft. of bedrock.
Bald Mountain Co.	Sierra County.	49,022	235,797 87	4 79		H. W. Wallace.	Calculated from data in Raymond's Rep., 1872.
Bennett's Claim.	Calaveras County.	903	1,320 00	1 37	13	J. Rathgeb.	Calculated from data in Raymond's Rep., 1872.
Johnston Claim.	Calaveras County.	2,293	1,500 00	65 5	20	J. Rathgeb.	Calculated from data in Raymond's Rep., 1872.
Hedwick's Claim.	Calaveras County.	2,563	1,450 00	45 5	20	J. Rathgeb.	Calculated from data in Raymond's Rep., 1872.
Kansas Co.	French Corral, Nev. Co.	67,500	223,000 00	3 30	27	Hamilton Smith, Jr.	Cement claim.
Empire Claim.	French Corral, Nev. Co.	20,106	200,000 00	6 85	18	Hamilton Smith, Jr.	The richest gravel selected and milled.
Nebraska Co.	French Corral, Nev. Co.	(tons) 600	0,000 00	15 00 pr ton.		Hamilton Smith, Jr.	
Blue Point.	Smartsville, Yuba Co.	93,944	115,728 17	1 23	57	Hamilton Smith, Jr.	
No. 8 Claim, 1874-5.	N. Bloomfield, Nev. Co.	1,858,000	74,271 77	03 9	130	Henry C. Perkins.	
No. 8 Claim, 1874-5.	N. Bloomfield, Nev. Co.	2,910,100	192,735 73	06 6	200	R. Abbey.	
French Hill.	Stanislaus County.	10,368	9,732 33	9 38	18	R. Abbey.	
Light Claim.	Stanislaus County.	75,598	8,498 35	11 4	57	Joseph Messerer.	
Siegar Claim.	Stanislaus County.	155,347	20,197 07	13	33	J. L. Jernegan, Jr.	Top gravel.
New Kelly Claim.	Stanislaus County.	161,032	8,852 31	054		J. L. Jernegan, Jr.	This ground was washed in 170 days & 6 hrs, com July 2, '70, ending Aug. 3, '77. Includes top and bottom gravel.
New Kelly Claim.	Stanislaus County.	252,614	35,012 33	13 8		J. L. Jernegan, Jr.	Upper bench gravel.
Gold Run.	Placer County.	43,000,000	2,074,350 00	04 8		Wm. H. Pettee.	This deposit contains many large boulders.
Paragon Mine.	Placer County.	124,000	92,000 00	74 2	70	Joseph McGillivray.	
Paragon Mine.	Placer County.	22,275	17,387 73	78	71	Joseph McGillivray.	
Dardanelles & Co.	Forest Hill, Placer Co.	3,030,000	470,000 00	13 1	150	Joseph McGillivray.	
McCart's Diggings.	Columbia Hill, Nev. Co.	3,000,000	345,063 10	04 3		J. D. Hague.	Rep. Eureka Lake & Yuba Canal Co. Claims, p. 37.
Smartsville Mine.	Sucker Flat, Yuba Co.	2,042,350	400,000 00	19 5	112	Amos Bowman.	
Union Gravel Mine.	Empire Hill.	792,000	120,000 00	15	00	Amos Bowman.	
Pactolus Gravel Mine.	Yuba County.	1,468,800	205,000 00	20 8	85	Amos Bowman.	See Report on the Smartsville Blue Gravel and Excelsior Canal Co., pp. 32-35.
Blue Gravel Mine.	Temperance Hill.	2,440,120	1,500,000 00	63	83	Amos Bowman.	
Pittsburg.	Yuba County.	565,700	237,000 00	41	50	Amos Bowman.	
Pactolus.	Yuba County.	60,000	40,000 00	66	44	Wm. Ashburner & J. D. Hague.	
Crawford's Claim.	El Dorado County.	77,830	35,046 00	45	35	J. J. Crawford.	
Pioneer Tunnel.	Sierra County.	833.37	1,400 53	1 50		Charles Hendel.	1,186 feet tunnel in gravel; 10 to 20 feet above bedrock.
Green Flat.	Plumas County.	22,000	15,000 00	67 5	15	Aug. J. Bowie, Jr.	
Fale's Hill.	Plumas County.	25,000	4,794 40	10	75	Aug. J. Bowie, Jr.	
McDoran Claim.	Plumas County.	5,555	300 00	05 4	20	Aug. J. Bowie, Jr.	
Bean's Hill.	Plumas County.	314	220 00	5	5	Aug. J. Bowie, Jr.	Shallow spots.
Jack's Hill.	Plumas County.	70	37 37	05	80	Aug. J. Bowie, Jr.	
Gardner's Point.	Plumas County.	143,148	113,000 00	70	80	Aug. J. Bowie, Jr.	Estimated from best obtainable data.
Light Claim, La Grange.	Stanislaus County.	740,640	61,714 27	08 0	43	Aug. J. Bowie, Jr.	Banks contained several thick strata of sand.
Kelly Claim.	Stanislaus County.	701,085	15,770 34	02 2	100	Aug. J. Bowie, Jr.	Pay stratum adjoining bedrock previously drifted.
French Hill Claim.	Stanislaus County.	1,020,347	188,433 11	15 5	30	Aug. J. Bowie, Jr.	Originally rich; portion drifted in early days.
Kelly Claim.	Stanislaus County.	85,000	3,406 33	04	85	Aug. J. Bowie, Jr.	Results obtained from cleaning out a deep hole.
Chesnuau Claim.	Stanislaus County.	27,250	11,000 00	40 4	18	Aug. J. Bowie, Jr.	Shallow ground.
Chesnuau Claim.	Stanislaus County.	333,880	02,980 37	13 6	00	Aug. J. Bowie, Jr.	Virgin ground.
New Light Claim.	Stanislaus County.	607,347	45,511 31	06 8	35	Aug. J. Bowie, Jr.	Drifted in place.
Johnson Claim.	Stanislaus County.	106,432	9,148 27	04 6	30	Aug. J. Bowie, Jr.	Virgin ground.
New Claim.	Stanislaus County.	17,796	773 72	04 3	412	Aug. J. Bowie, Jr.	Virgin ground.
Trans-Baikal Mines.	Siberia.	4,143,280	8,814,210 00	2 12		R. Pumpelly.	Sluice washings, App. 5. "Across America and Asia."
Riviere du Loup.	Canada.	3,220	4,323 00	1 34		Sir W. E. Logan.	"Geological Survey of Canada," '03, vol. 1, p. 74.
Musa Gold Field.	Oshima Prov., Japan.	2,800,000	21,000 00	00 75		Henry S. Munroe.	Engineering & Mining Journal, vol. 22, pp. 425, 426.
Gold diggs of Miasak, 1822-41.	Siberia.	2,097,502	grams 3,114			N. Sewastjanov.	These results have been calculated from tables pub.
Gold diggs of Miasak, 1841-51.	Siberia.	2,820,700	grams 2,855			N. Sewastjanov.	lished in the <i>Berg-und huettenmaennische Zeitung</i> .
Gold diggs of Miasak, 1851-61.	Siberia.	3,801,956	grams 2,000			N. Sewastjanov.	January 19, 1877. Official report of the Director at Miasak.
Gold diggs of Miasak, 1861-75.	Siberia.	3,716,250	grams 2,400			N. Sewastjanov.	

Table No. 2.—Showing the Yield of Gravel Per Cubic Yard in the Japan Gold Fields.

NAME OF CLAIM.	LOCATION	NO. OF CUBIC METERS WASHED.	VALUE OF GNE CUBIC METER IN CENTS.	YIELD PER CUBIC YARD.	HEIGHT OF BANKS FEET.	AUTHORITY.	REMARKS.
Moshietsu.	Kudo Gold Field, Shiribeshi Province, Japan.	2	\$0 00.42	\$0 00.30	5	Henry S. Munroe.	See "Gold Fields of Yesso," p. 35.
Usuetsu.	Kudo Gold Field, Shiribeshi Province, Japan.	2	0 07	0 05	3	Henry S. Munroe.	See "Gold Fields of Yesso," p. 35.
Getobe.	Esashi Gold Field, Oshima Province, Japan.	0.25	0 71	0 00	8	Henry S. Munroe.	See "Gold Fields of Yesso," pp. 42, 43.
Jimikishi.		2	1 53	1 31	5	Henry S. Munroe.	See "Gold Fields of Yesso," pp. 42, 43.
Jimikishi.		2	1 53	0 20	3.8	Henry S. Munroe.	See "Gold Fields of Yesso," pp. 42, 43.
Gokatte.		0.60	0 07	0 01	5	Henry S. Munroe.	See "Gold Fields of Yesso," pp. 42, 43.
Todo.		1	0 42	0 05	4	Henry S. Munroe.	See "Gold Fields of Yesso," pp. 42, 43.
Mena.		1	0 29	0 04	5	Henry S. Munroe.	See "Gold Fields of Yesso," pp. 42, 43.
Sanguurou.	Musa Gold Field, Oshima Province, Japan.	7	1 89	1 44	10	Henry S. Munroe.	See "Gold Fields of Yesso," p. 64.
Sanguurou.	Musa Gold Field, Oshima Province, Japan.	2.60	1 31	0 00	6	Henry S. Munroe.	See "Gold Fields of Yesso," p. 64.
Shikubono.	Musa Gold Field, Oshima Province, Japan.	3	1 31	0 75	10 to 12	Henry S. Munroe.	See "Gold Fields of Yesso," p. 64.
Unoshiri.	Musa Gold Field, Oshima Province, Japan.	8	0 60	0 46	13	Henry S. Munroe.	See "Gold Fields of Yesso," p. 64.
Unoshiri.	Musa Gold Field, Oshima Province, Japan.	4	0 56	0 43		Henry S. Munroe.	See "Gold Fields of Yesso," p. 64.
Mihagova.	Musa Gold Field, Oshima Province, Japan.	7	0 50	0 38		Henry S. Munroe.	See "Gold Fields of Yesso," p. 64.
TOSHIETSU GOLD FIELD.							
Upper Toshi.	Iburi Province, Japan.	1.25	8 11	6 13	4 to 0	Henry S. Munroe.	"These results were obtained by washing measured quantities of gravel in different parts of this field. In measuring, no allowance has been made for the increased bulk due to the loosening of the gravel and to vacant spaces necessarily left between the stones in filling the measuring box." See report of Henry S. Munroe, M. E., "Gold Fields of Yesso," pp. 23, 24.
Akabuchi.	Iburi Province, Japan.	3.00	6 81	5 16		Henry S. Munroe.	
Kusube.	Iburi Province, Japan.	3.00	4 00	3 53		Henry S. Munroe.	
Highest Terrace.	Iburi Province, Japan.	3.00	1 00	0 25	35 to 37	Henry S. Munroe.	
Gokisawa.	Iburi Province, Japan.	3.00	4 08	3 07	18	Henry S. Munroe.	
Ponkajisawa.	Iburi Province, Japan.	1.00	1 84	1 40		Henry S. Munroe.	
Chingkombe.	Iburi Province, Japan.	1.00	0 20	0 15		Henry S. Munroe.	
Nisheumbetsu.	Iburi Province, Japan.	1.00	0 61	0 01	5	Henry S. Munroe.	
Average.			5.00	3.77			

Yield of the Russian Gold Fields for the Year 1874.

Name of works.	No. places where washing is carried on.	No. cubic yards of gravel washed.	Total yield of gold, Troy pounds.	Yield of gravel per cubic yard washed, Troy grains.
Government Works:				
Beresowsk.	10	298,208	1,004.88	10.7
Bogolskowsk.	28	111,548	646.48	33.5
Miasak.	15	384,312	2,260.98	33.8
Nertschinsk.	1	564,044	6,592.23	67.2
Private Works, East'n Siberia.—District Jenisei:				
Northern division.	104	1,190,028	7,158.20	34.8
Southern division.	110	1,108,116	7,621.39	34.8
Atschinsk.	19	168,863	727.70	24.3
Minusinsk.	30	318,046	1,423.01	25.8
Kansk and Nischnedinsk.	20	115,071	727.84	30.4
Olekmsk.	34	637,332	20,708.18	234.3
Werchneudinsk.	13	60,070	264.60	25.8
Bargusinsk.	22	155,038	1,702.05	63.2
Nertschinsk.	213	852,205	7,403.16	50.0
Werchneudinsk.	1	17,119	10.01	11.1
District of Amur.	4	323,707	6,508.40	114.1
Western Siberia:				
Marinsk.	78	620,007	2,073.25	21.6
Altai.	34	731,774	3,507.31	27.6
Semipalatinski district.	10	210,568	407.07	11.2
Akmoletski district.	1	137	14	5.0
Government Greuburg.	243	791,100	4,575.57	33.3
Government Perm.	121	480,014	2,543.17	30.5
Other works in Ural.	81	743,625	3,340.73	25.0

\* These tables have been calculated from the official statements published in the *Berg-und huettenmaennische Zeitung* of April 20, 1877. The gold pounds have been figured from the Russian doll, which, according to the mint standard, is 760 fine. The number of yards washed has been estimated from the Russian pud. 100 puds have been assumed to equal 1,053 cubic yard. See *Berg-und huettenmaennische Zeitung*, January 19, 1877. On this basis the cubic yard gravel weighs 3,307 pounds avoirdupois. The cement gravel of Nevada county, Cal., will approximate 3,600 pounds avoirdupois per cubic yard.

## The Governor's Message.

The Message of his Excellency Governor Irwin was submitted to the Legislature at the close of last week. It is an able document, exhibiting a thorough study into the material interests of the State, and even those who do not agree with him as to specific policies and measures, concede to him the credit for honest and clear expression of matters which he deems for the public good. The message is quite long and we can but note the leading points. The full document will be printed by the State and can be had on application by those who desire to make a careful study of its recommendations.

After fitting allusion to the impediments to industrial progress occasioned by the unfavorable season, the Governor discusses the financial status of the State and then the rate of taxation last year, as compared with former years. For the future the message recommends as follows: "I cannot too strongly urge on the Legislature the greatest circumspection and the most rigid economy compatible with the public honor and the public interests in making such appropriations. If there is one demand which universal public sentiment at this time emphasizes more than another, it is the demand for retrenchment and economy in public expenditure."

Concerning the State board of equalization the Governor deprecates the sweeping away of the original board, and expresses at length his "views on the necessity of some central author-

ity, with power to equalize assessments, made by county or district assessors. \* \* \* And it is to be sincerely hoped that in any new Constitution which may be framed for the State, care will be taken that, if it does not provide itself for the establishment of the necessary machinery to secure equal and impartial assessments of property, it shall at least not contain provisions inhibiting the Legislature from creating such machinery."

On the subject of public schools, the message gives the Superintendent of public instruction much credit for his efforts to improve the methods of teachers and raise the character of schools. It concurs in the Superintendents recommendation in favor of the High schools as a part of our school system.

The governor gives close attention to the affairs of the State lunatic asylums and the State prisons, for the points of which we must refer readers to the document itself.

The State University, the Governor says, has made gratifying progress considering the limited resources which it has had at command. Concerning appropriations for this institution he says: "It will be necessary, to some extent, to supplement the revenues of the University by appropriations from the State Treasury. But such appropriations should be asked for only in cases of the most urgent necessity, and should be granted only to the extent of such necessity. It cannot be denied that a large body of tax-payers regard with ill-concealed hostility all propositions for large appropriations from the State treasury for an institution, the direct and immediate benefits of which must, from the very nature of the case, inure to but a very small per centage of the youth of the State. These appropriations, if frequent and for large amounts, may be, and doubtless will be, used by the opponents of the

University to excite among the people, at large, hostility to the institution itself. While the Legislature ought not, in my judgment, to refuse all appropriations to the University, it ought to make them only for such necessary objects and in such reasonable amounts as may be requisite to its continued usefulness and growth."

A general approval of Prof. Hilgard's efforts for the building up of the department of agriculture is given and, in conclusion, the Governor says: "All things considered, the progress made toward the establishment of a University, ought in my judgement, to be satisfactory to the people of the State; and, also, that I should regard any serious attempt to reorganize it on a different basis, or to change radically its character, as a very grave mistake."

In regard to the Chinese question, the Governor says the plain duty of the United States is to abrogate the Burlingame Treaty.

The Governor accepts the fact that the last election ordered a constitutional convention and points out the duty of the present legislature in arranging preliminaries for its session. As to choosing members of the convention, the Governor favors each senatorial and assembly district choosing its own representatives rather than by general ballot throughout the State. He thinks also that the member should be fairly paid for their services because he doubts not that "In some districts, the citizen best qualified to be a member of the Convention, and possessing the confidence of the electors of the district in the greatest degree, may be too poor to give his time without pay."

The message concludes by recommending that inasmuch as a constitutional convention will be held, the present Legislature should enact only such laws at this session, as the public exigencies imperatively demand.



### The Great Floras of America.

The first fruits of last summer's visit of distinguished scientists to our coast, under the auspices of Prof. Hayden's survey, are beginning to appear. We have had the advantage of examining an advance abstract of Prof. Hayden's report of the summer's work, and thus gain for our readers the earliest information on a very interesting and important subject. The hotany of the survey was represented the past season by the two great masters of that department, Sir Joseph D. Hooker, Director of the Gardens of Kew, England, and President of the Royal Society of London, and Prof. Asa Gray, of Cambridge, Massachusetts. Their examination extended over a great portion of Colorado, Wyoming, Utah, Nevada and California. Their investigation into the alpine floras and tree vegetation of the Rocky mountains and Sierra Nevada enabled them to give a clear idea of the relation and influence of the climatic conditions on both sides of the great mountain ranges. Sir Joseph Hooker, whose botanical researches embrace the greater part of Europe; the Indies, from the Bay of Bengal across the Himalayas to Thibet; the Antarctic region and the southern part of South America; New Zealand, Australia, South Africa, Morocco and Asia Minor presents in the English periodical *Nature*, for October 25th, an outline of his studies during the season, and this outline, when filled out, will form a most important report for the eleventh annual report of the Hayden Survey. It will be seen at a glance that the report will be of a most comprehensive character, and cannot fail to be of the highest interest to our people. The tree vegetation, and especially the conifers, were made special objects of study, and many obscure points were cleared up.

Of a section of the Rocky mountains, comprising Colorado, Wyoming and Utah, Dr. Hooker says: "Such a section of the Rocky mountains must hence contain certain representatives of three very distinct American floras, each characteristic of immense areas of the continent. There are two temperate and two cold or mountain floras, viz.: 1. A prairie flora, derived from the eastward. 2. A so-called desert and saline flora, derived from the west. 3. A sub-alpine; and, 4, an alpine flora—the two latter of widely different origin, and in one sense proper to the Rocky mountain ranges."

The principal American regions with which the comparison will have first to be instituted are four. Two of these are, in a broad sense, humid; one, that of the Atlantic coast, and which extends thence west to the Mississippi river, including the forested shores of that river's western affluents; the other that of the Pacific side, from the Sierra Nevada to the western ocean; and two inland, that of the northern part of the continent, extending to the polar regions, and that of the southern part, extending through New Mexico to the Cordillera of Mexico proper.

The first and second (Atlantic plus Mississippi and the Pacific) regions are traversed by meridional chains of mountains approximately parallel to the Rocky mountains; namely, on the Atlantic side, by the various systems often included under the general term Appalachian, which extend from Maine to Georgia, and on the Pacific side by the Sierra Nevada, which bounds California on the east. The third and fourth of the regions present a continuation of the Rocky mountains of Colorado and Utah, flanked for a certain distance by an eastern prairie flora extending from the British possessions to Texas, and a western desert or saline flora, extending from the Snake river to Arizona and Mexico. Thus the Colorado and Utah floras might be expected to contain representatives of all the various vegetations of North America, except the small tropical region of Florida, which is confined to the extreme southeast of the continent.

The most singular botanical feature of North America is unquestionably the marked contrast between its two humid floras, namely, those of the Atlantic plus Mississippi, and the Pacific one; this has been ably illustrated and discussed by Dr. Gray in his various communications to the American Academy of Sciences and elsewhere, and he has further largely traced the peculiarities of each to their source, thus laying the foundations of all future resources into the botanical geography of North America; but the relations of the dry intermediate region, either to these or to the floras of other countries, had not been similarly treated, and this we hope that we have now materials for discussing.

Dr. Hooker sums up the results of the joint investigations of Dr. Gray and himself—aided by Dr. Gray's previously intimate knowledge of the elements of the American flora—from the Mississippi to the Pacific coast: "that the vegetation of the middle latitudes of the continent resolves itself into three principal meridional floras, incomparably more diverse than those presented by any similar meridians in the Old World, being, in fact, as far as the trees, shrubs and many genera of herbaceous plants are concerned, absolutely distinct. These are the two humid and the dry intermediate regions, above indicated."

Each of these, again, is subdivisible into three, as follows:

1. The Atlantic slope plus Mississippi region, subdivisible into (A) an Atlantic, (B) a Mississippi valley and (V) an interposed mountain region with a temperate and sub-alpine flora.

2. The Pacific slope, subdivisible, into (A) a

very humid, cool forest-clad coast range; (B) the great hot, drier California valley formed by the San Juan river flowing to the north and the Sacramento river flowing to the south, both into the Bay of San Francisco; and (V) the Sierra Nevada flora, temperate, sub-alpine and alpine.

3. The Rocky mountain region (in its wildest sense extending from the Mississippi beyond its forest region to the Sierra Nevada), subdivisible into (A) a prairie flora; (B) a desert or saline flora; (V) a Rocky mountain proper flora, temperate, sub-alpine and alpine.

As above stated, the difference between the floras of the first and second of these regions, is specifically, and to a great extent generically absolute; not a pine or oak, maple, elm, plane or birch of Eastern America extends to Western, and genera of 30 to 50 species are confined to each. The Rocky mountain region again, though abundantly distinct from both, has a few elements of the eastern region and still more of the western.

Many interesting facts connected with the origin and distribution of American plants and the introduction of various types into the three regions, presented themselves to our observation or our minds during our wanderings; many of these are suggestive of comparative study with the admirable results of Heer's and Lesqueren's investigations into the pliocene and miocene plants of the north temperate and frigid zones, and which had already engaged Dr. Gray's attention, as may be found in his various publications. No less interesting are the traces of the influence of a glacial and a warmer period in directing the course of migration of Arctic forms southward, and Mexican forms northward in the continent, and of the effects of the great body of water that occupied the whole saline region during (as it would appear) a glacial period.

Lastly, curious information was obtained respecting the ages of not only the big trees of California, but of equally aged pines and junipers, which are proofs of that duration of existing conditions of climate, for which evidence has hitherto been sought rather amongst fossil than amongst living organisms.

WOODWARD'S GARDENS has the following new attractions: The buffalo chase; large whale skeleton; new museum; improvements in the zoological department, besides the other features which have made it popular.

### TO QUERISTS.

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Taxes will become delinquent on the FIRST MONDAY in January, 1878, and unless paid prior thereto, Five per cent. will be added to the amount thereof.

WM. FORD,

Tax Collector of the City and County of San Francisco.

SAN FRANCISCO, October 22, 1877.

### Montgomery Avenue Tax.

Notice is hereby given that a certified copy of the Assessment Book of Real Estate, which is subject to Assessment to defray expenses incurred by the opening of Montgomery Avenue, has this day been placed in my hands to collect Taxes thereon.

Said taxes are for the Fiscal Year 1877-78, and are now due and payable at the office of the undersigned, Room No. 1, City Hall. All Taxes remaining unpaid on the FIRST MONDAY of January, 1878, will have Five per cent. added thereto.

WM. FORD,

Tax Collector for the City and County of San Francisco.

SAN FRANCISCO, October 22, 1877.

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Notice is hereby given, that a certified copy of the Assessment Book of the Real Estate which is subject for the payment of Principal and Interest upon "Dupont-Street Bonds," as directed by an Act of the Legislature of California to authorize the Widening of Dupont Street in the City of San Francisco, "Approved March 23, A. D. 1876," has this day been placed in my hands for collection. The Laws in regard to the collection of the same will be strictly enforced.

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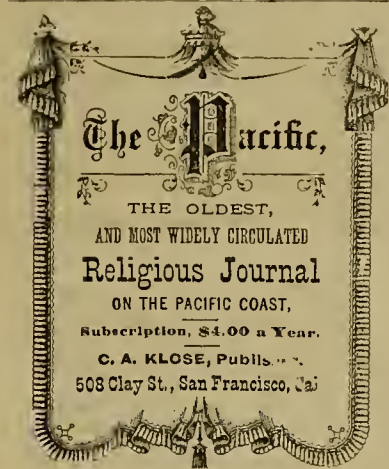
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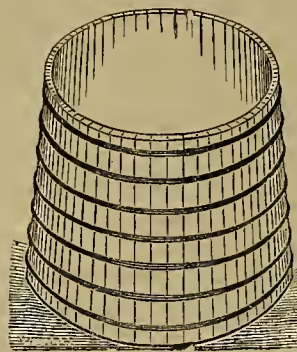


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Continued from Page 373.

surprised both as to size of vein and quantity and quality of ore extracted and now on the dumps. The vein is not, as has been generally supposed—in minor's parlance—a "small, rich strata," but it is a good, strong vein, the ore streak running from six inches to two feet in width, the lowest workings showing the largest ore vein. Both the north and south mines can be worked by tunnels run in on the vein to the depth of 350 feet. There are now about 350 tons of high-grade ore on the dumps.

For.—This mine is developing splendidly; ore vein increasing in size and improving in quality as depth is attained.

CASCAD.—Sinking actively on this mine, with a better showing than ever.

SWILLING.—Very fine sulphuret ore struck in the shaft, which is being sunk on contract.

ISABELLA.—Sinking shaft suspended for the present for want of timbers. Rich ore being extracted from open cut. The shaft, now 65 feet deep, has produced no ore for the last 20 feet. This seems characteristic of nearly all the mines in this district. At a depth of 20 to 50 feet the ore gives out, but in all cases where sinking has been continued, richer ore and more of it has been developed.

THERE are a number of miners in the hills, some working on old locations others prospecting for new ones. All of them have their pockets full of rich specimens. Humboldt district has all the characteristics of a rich mineral country.

PECK DISTRICT.—In the Black Warrior the drift is 130 feet from the surface. Sinking will be resumed to north vein in heavy ore, showing the usual amount of sulphuret and native silver. Contract let to sink and drift; drifting commenced to-day.

PECK.—Rich ore in bottom of main shaft, about 60 feet below north tunnel.

CASTLE DOME.—*Arizona Sentinel*, Dec. 8: Castle Dome improves. The Arkansas has turned out 30 tons of clean lead in less than 20 days and has on the dumps over 10 tons of specimens, weighing from 100 to 700 pounds each. The district is suffering from want of transportation, although another heavy team has been sent up there this week. Bettis says he has now known Castle Dome for 14 years and never saw it looking so well. At the various mines there are now over 100 tons of lead ahead of the teams and some 50 tons at the river ahead of the steamboats.

## Colorado.

WARSAW.—*Sunshine Courier*, Dec. 8: Continuing to get such rich ore in the upper tunnel, the owners of the Warsaw concluded, a few days since, to go back to the lower tunnel and push it through to the chimney they have been working above. Already the zinc, which made its appearance in the lower tunnel in the last working, a few weeks ago, is giving away to tellurides.

THE Corning tunnel is now in about 1,080 feet. It is worked by night and day shifts of single-handed workers—two working side by side in the breast each shift. They are making eight feet per week, and having already reached the point at which it was expected they would cut the slide lode, it cannot be long before it will be tapped. All told, the tunnel employs 14 hands. They are shipping ore by freight.

THE Silver Wing cluster of lodes, in the San Juan country, is justly a noted piece of mining property. It embraces over 30 distinct veins, all within the limits of one tunnel site and averaging two and a half feet of mineral each. Patents have been secured on enough of the lodes to cover the whole surface of the tunnel site, and every development so far made only adds to the great prospective value of the property. The different veins at the surface have assayed from 15 ounces to 2,700 ounces of silver per ton. Ten blind lodes have already been cut, which, in connection with the veins already known to exist, go to show the whole mountain to be a perfect network of mineral. It is owned by leading citizens of Colorado Springs, who have incorporated it into a company, and who, having pushed operations in the past, will continue to do so in the future.

## Idaho.

THE MINES.—Owyhee *Avananche*, Dec. 8: The mining situation here is daily growing brighter. At the Golden Chariot the crosscut on the 15th level has been started and the work is going ahead finely. Mr. Sands has 17 men at work in the Illinois Central, who are taking out \$40 rock from the third and fourth levels. Some idle wild rock is being crushed at the Leonard mill, which will yield \$120 to the ton. The Black Jack is looking better every day. There is no change in Empire matters, but assurances have been received from below that the mine is to be started up again in a few days. The Potosi will also probably start up soon under new auspices. Three men have taken out nearly \$3,000 from operations in the Whiskey mine since the 1st of May, and many small mines in the vicinity are yielding well.

## Utah.

FRISCO.—*Cor. Salt Lake Tribune*, Dec. 8: Frisco is sure to be a big and thriving place. Already there are over 500 inhabitants, and it will double in three months from today, for the mineral wealth is here to develop it.

THE leaching works are fast approaching completion.

MR. WILLIAMS, of Williams & Co.'s smelter at Millford, who is said to be the most successful person in Utah in the working of difficult and rebellious ores, is to take charge of the smelters here. They are fast approaching completion and will be the most complete in Utah, with plenty of wealth to back them.

BENHAM.—Like the majority of mining camps at the present day, Benham feels the pressure of hard times, yet instead of becoming disheartened, it seems to have the effect upon her miners to redouble their exertions to open out their claims.

CONSIDERABLE developments are being made in the vicinity of Carr fork, and some rich ore is being extracted. This portion of Bingham is attracting considerable attention, and well merits it. C. A. Lyndon has struck it big in the Mormon Nell. Assays show up in the hundreds. The mine is at present being worked on lease.

THE Ashland is still driving ahead with their tunnel, and the prospect seems good for ore. The Neptune at present remains idle.

LIVE YANKEE, leased by Wm. Jackson, is turning out some fair ore, and the outlook is very encouraging.

THE Aladdin is working on lease. A tunnel is being run to tap the vein, and is now in about 130 feet.

## PATENTS AND INVENTIONS.

### List of U. S. Patents Issued to Pacific Coast Inventors.

[FROM OFFICIAL REPORTS FOR THE MINING AND SCIENTIFIC PRESS, DEWEY & CO., PUBLISHERS AND U. S. AND FOREIGN PATENT AGENTS.]

By Special Dispatch from Washington, D. C.

WEEK ENDING NOVEMBER 27TH.

BESK.—John F. Boye, Cal.  
CONSOLIDATION PADLOCK.—W. R. Young, Healdsburg, Cal.  
TIMING ATTACHMENT FOR RACING VEHICLES.—John L. Boone and E. J. Fraser, S. F.  
STONEWARE KILNS.—C. Gladding, Lincoln, Cal.  
CAR WHEELS.—H. S. Smith, S. F.

THE patents are not ready for delivery by the Patent Office until some 14 days after the date of issue.

NOTE.—Copies of U. S. and Foreign Patents furnished by DEWEY & CO., in the shortest time possible (by telegraph or otherwise) at the lowest rates. All patent business for Pacific coast inventors transacted with perfect security and in the shortest possible time.

## Legislative Committees.

The following are the standing committees of the Assembly appointed by the Speaker:

On Public Lands.—Welsh, Hanna, Breen, Wheat, Blackwell, Knott, Sherman, May and Smyth.

On Public Expenditures and Accounts.—Hinsaw, Nott, Smyth, McClure and Johnson.

On Commerce and Navigation.—Haworth, Asmussen, Dixon, Griffith and Dare.

On Hospitals.—Montague, Mayfield, Thompson, Murphy of San Francisco and Wilson.

On Judiciary.—Anderson, Waters, Barstow, Holloway, Murphy of Del Norte, Coffey, Hart, Dewitt, Welsh, Swift and Breen.

On Claims.—Ostrom, Hinsaw, Garver, Thompson, Smith, McComas and Blake.

On Irrigation.—Ewing, Myers, Young, Dorsey, Mace, Routier and Sherman.

On State Prison.—Miller, Moffat, Griffith, Broderick, Allen, May and Abbott.

On Swamp Lands.—Hart, Ostrom, Haile, Dewitt, Ewing, Brooks, Adams, Kercheval, Sargent, Robinson and Ames.

On Public Morals.—Adams, Ellis, Gough, Blake and Ames.

On Mileage.—Hicks, Griffin and Conway.

On State Library.—Tobin, May and Johnson.

On Indian Affairs.—Robinson, Murphy, of Del Norte, afterwards excused, Adams, Pauly and Russ.

On Grape Culture.—Mayfield, McComas, Routier, McClure, Wheat, Hinsaw and Ames.

On Rules and Regulations.—Barstow, Gildea, Murphy, of San Francisco, Abbott and Backus.

On Public Printing.—Upton, Gough, Pace, Coffey, Conroy, Farnum and Connolly.

On Roads and Highways.—Wheat, Ludgate, Hugg, Cooley and Whitlock.

On Mines and Mining Interests.—Blackwell, Byington, Hugg, Wheat, Dunlap, Moffat and Wilson.

On Engrossment.—Young, Asmussen, Dare, Denni and Brooks.

On Enrollment.—Broderick, Neally, Long, Farnum and Russ.

On Elections.—Neally, Holloway, Griffin, Ellis, Griffith, Forsyth and Brooks.

On Military Affairs.—Dorsey, Tobin, Backus, Denni and Dare.

On Ways and Means.—Mott, Gildea, Waters, Garver, Kercheval and Tuttle.

On Corporations.—Tuttle, Waters, Haile, Haworth, Garver, Dixon, Meyers, Swift and Nott.

On Internal Improvements.—Dunlap, Blake, Mace, Forsyth and Brooks.

On Public Buildings.—Dixon, Upton, Ludgate, Connolly, Forsyth, Byington and Long.

On Counties and County Boundaries.—Pace, Montague, Warden, Mayfield, Ewing, McComas and Cooley.

On Federal Relations.—Gildea, Anderson, Murphy, of Del Norte, Swift, Barstow, Moffat and Johnson.

On Education.—Haile, Tuttle, Young, Upton, Pauly, Hicks and Ahott.

On Agricultural, Mining and Mechanic Arts College.—Tobin, Broderick, Warden, McClure, Sargent and Whitlock.

Mr. Murphy, at his own request, was excused from service on the Committee on Indian Affairs.

### Senate Committees.

The following comprise the standing committees of the Senate:

Agriculture.—Hill, Montgomery, Crane, Flint Coleman.

Claims.—McCoppin, P. W. Murphy, Norton, Pierson, Smith.

Commerce and Navigation.—Howe, McCoppin, Beazell, J. C. Murphy, Dean.

Contingent Expenses.—Rogers, P. W. Murphy, Whitney, Donovan, Crane.

Corporations.—Searls, Hirley, McCarthy, Gwin, Hilborn, Evans, W. H. Brown.

Engrossed Bills.—Craig, Howe, Hunt, B. D. Murphy, Ream.

Enrolled Bills.—McCarthy, Rogers, Angney, Boyston, Norton.

Federal Relations.—Lambert, Satherwhite, Hilborn, Searles, Norton.

Finance.—Angney, McCoppin, Gwin, W. H. Brown, Norton.

Hospitals.—Ream, Craig, Flint.

Internal Improvements.—Fowler, B. D. Murphy, McCarthy, Boyston, Coleman.

Judiciary.—McGarvey, Pierson, Curtis, Smith, Porter, Lewis, B. D. Murphy, Lambert, Craig.

Mileage.—Smith, Whitney, Angney.

Military Affairs.—Boyston, Evans, J. C. Murphy.

Mines and Mining.—Coleman, Gwin, Ream, F. M. Brown, Searles.

Public Buildings other than Prison Buildings.—Donovan, Firman, Goodwin, Beazell, Whitney.

Swamp, Overflowed and Public Lands.—Pierson, Fowler, Shirley, Evans, Dean.

Public Morals.—Montgomery, Donovan and Dean.

Public Printing.—J. C. Murphy, Porter, P. W. Murphy.

Roads and Highways.—P. W. Murphy, Crane, Hill.

State Library.—Curtis, J. C. Murphy, Norton.

State Prison.—Sbirley, Beazell, Whitney, McGarvey, Goodwin, Haymond, Nunan.

Irrigation and Water Rights.—Satterwhite, Fowler, Haymond, W. H. Brown, F. M. Brown.

Fisheries and Game.—Hilborn, Hill, Angney, J. C. Murphy, Nunan.

## News in Brief.

SMALLPOX has almost entirely disappeared from this city.

THE Turkish government has impressed the street car horses for the army.

THE New York police continue their raid on unlicensed liquor dealers.

THE National Exchange Bank of Troy, N. Y. has gone into voluntary liquidation.

AN investigation into the cause of the wreck of the *Huron* is in progress.

FRANCE offers \$500,000 in premiums at her Exposition next year.

THE debt of New York is \$130,000,000 to \$140,000,000; that of Paris, \$350,000,000.

OROVILLE cemetery is being undermined, so says the *Mercury*, by Chinese gold-miners.

DANIEL CREEDAN, a Sucker Flat miner, was killed by a cave on Tuesday night or Wednesday morning.

THE striking cigar makers are perfecting arrangements for a co-operative factory in New York.

DISPATCHES say that there is no truth in the story that Lerdo has renounced his claims to the Presidency of Mexico.

THERE are 52 prisoners in the House of Correction proper and 187 county jail prisoners in the institution.

A man named James Arthur was killed in the Consolidated Amador mine, Sutter creek last Sunday, by a cave.

THE amount of deposits in the Savings banks of the United States is estimated at \$1,500,000,000.

THE steamer *Oregon*, which will run from this city to Portland, Oregon, was launched this week at Chester, Pa.

THE property owned by the city of San Francisco, in park reservations, public squares, lots, buildings, etc., is valued at \$11,435,000.

JOHN W. YOUNG has been sued by his Eastern creditors, and his household goods in Salt Lake have been seized. They threaten to throw the Utah Western railroad into bankruptcy.

CONGRESSMAN DAVIS has presented to the House of Representatives a memorial of the San Francisco Chamber of Commerce, praying for an appropriation for a new Postoffice.

THE Tax-Collector's books show that the value of real estate, subject to taxation, in the city and county of San Francisco, is \$190,972,880, and the personal property, \$63,730,080.

THE City of Berlin has been towed into Liverpool by another Inman steamer. When within two days of Queenstown her shaft broke, which caused her delay.

THE brigantine *G. M. Jones*, from New York, for Halifax, has been run down at sea. All hands, except one seaman, were drowned.

THE street department fund of this city for the fiscal year is already exhausted, the \$300,000 intended for the year having been spent in six months.

THE Chicago *Tribune* has established a permanent agency in this city, the first Eastern paper which has done so.

ADVICES from Cape Town, dated Nov. 26th state that the government is granting lands in the Galeka country to Europeans and the volunteers are disbanding and returning to their homes.

DR. ALBERT T. BLEDSOE, editor of the *Southern Review*, a distinguished minister and former Professor of the University of Virginia, died at Alexandria, Va., on Saturday night of paralysis.

BLACKLOCK, of Gulf of California oyster canning fame, has been sentenced to the State Prison for seven years and nine months for forgery.

PETER B. SWEENEY has paid the last installment of \$400,000 and interest, which he agreed to pay New York in settlement of the Tweed ring suits against him.

A BILL has been introduced in Congress by Joyce, adjusting the salaries of Postmasters on the basis of the number of stamps cancelled instead of the number sold.

THE Postoffice Department has completed and is now issuing a printed advertisement in pamphlet form, inviting proposals for carrying mails on all routes on the Pacific coast States and Territories.

THE firm of Jno. G. Hodge & Co., well-known stationers of this city, have filed a petition in bankruptcy. Their indebtedness is \$280,000, with assets at \$240,000. The cause of the failure is attributed to dull times and investments in real estate in the interior which have not proved profitable.

MILAN is preparing for an International Exhibition in 1879. The outlay for the building, which is to be in the London Crystal Palace style, is set at the modest sum of \$150,000, two-thirds of which sum have already been subscribed in England and the rest in Italy.

LIEUT. WISE reports favorably on his official explorations of the Isthmus of Darien, with the view to the project of an inter-oceanic canal. He believes that it could be most easily executed directly from the valleys of the Tupisa and Tiatli to the Gulf of Uraba, and would not require any locks.

THE revolution in Ecuador has collapsed.

THE work of dredging Wilmington harbor is progressing.

WORK has been suspended on the Ironclad *Monadnock* at Mare island.

THEY are having good rains in Arizona, and farmers and miners are jubilant.

THE pile-drivers of this city have organized a benevolent association.

It is reported that Prince Bismarck has renewed his request to be relieved of office.

THE Board of Supervisors are asked to grant a franchise to a new gas company in this city.

COMPLAINTS are made that the settling up of the affairs of Tyler's defunct Collateral Bank is unnecessarily slow.

THE rifle match between the bank clerks last Saturday, was won by the Bank of California team.

DR. REINGER, physician of the Sutro Tunnel company, has died from injuries received by a fall from his horse.

THE London association has advised the syndicate that it proposes a subscription for \$10,000,000 in four per cent. bonds.

A Valisia dispatch states that Wells, Fargo & Co.'s box, containing \$225, was stolen on the 7th.

THE grading stakes of the railroad company have been placed to the foot of Fifth street—the main thoroughfare of Benicia.

FIRE MARSHALL DURKEE of this city was thrown from his buggy one day this week and badly bruised.

THE barge *Governor Hayes*, was snagged Saturday night in the river near Colusa, and 12,000 sacks of wheat belonging to Dr. Gleun were lost.

THE Ways and Means Committee will devote the greater part of the recess to continuation of their work upon the proposed new tariff and internal revenue bill.

EX-GOVERNOR PINCHBACK of Louisiana, has addressed an open letter to Governor Nicholls resigning his place as United States Senator from that State.

PLEVNA has surrendered to the Russians, after a severe engagement. Osman Pasha attempted to break through the lines but was compelled to lay down his arms.

MUSICAL sounds have been transmitted by means of a telephone to Columbus, O. from Chicago, a circuit of 375 miles. The longest distance yet tried.

ONE night last week a man entered a pawnshop on Clay street, and asked to be shown a watch. When he received it he threw a handful of pepper in the proprietor's eyes and escaped.

THE strike at Sheffield England, which lasted six weeks, during which time many outrages have been committed has ended. The men consented to a reduction of wages.

THE Senate Committee on Military affairs has authorized Maxey, of Texas, to report a bill to appropriate \$200,000 for the erection of suitable posts on the Rio Grande, to be located at the discretion of the Secretary of War.

PAGE's bill provides that Oakland shall be a port of delivery within the collection district of San Francisco, and that a Deputy Collector be appointed, to reside at Oakland, and receive such salary as the Secretary of the Treasury may designate.

THE Los Angeles *Herald*, December 6th, states that Jesus Gomez, and Virginia, while digging gravel in an arroyo in east Los Angeles for Hancock Johnson, came upon a box containing \$4,000 in gold dust, \$375 in coin and about \$1,000 worth of jewelry.

H. D. BACON of Oakland has offered his large and valuable art collection to the University of California, together with \$25,000, provided the State will add another \$25,000. He has also given to the University, without condition, his fine library, said to contain 10,000 volumes.

GIDDINGS, of Texas, will introduce a bill in the House to incorporate the Galveston and Camargo railway, to run from Galveston to Rio Grande city, 315 miles. A subsidy of \$2,125,000 is asked, which the company has 25 years to repay, and the road is to be built in 15 months.

ON December 19th, the creditors of Duncan's Bank will elect an assignee at the Register's office, No. 636 Clay street. Only those creditors can vote who shall then have proved their claims, and no others will be entitled to share in whatever dividend may be declared.

THE Southern Pacific Railroad Company has placed at the railroad crossing of Brannan, Bryant, Harrison, Folsom, Howard, Mission and Valencia streets, automatic electrical alarm bells, which give warning of the approach of trains.

THE ladies' Evangelical and Philanthropical society in this city will shortly open a reading room where working women and girls can pass their leisure hours pleasantly and profitably. The employment Committee of the society will also be represented there, and upon applicants making known their wants, every effort will be made by the Committee to procure work for them.



Mining Share Market.

The principal topic of interest in stock circles is the Justice mine investigation. The Committee investigating the affairs of the mine are still at work, and have made some exceedingly startling developments. The valuable portion of the Justice location has been decided away to the Alta company for a consideration of \$1, and the transaction kept secret from the stockholders. The records are found to be mutilated, a number of vouchers for supplies forwarded, wages paid, and milling expenses, are missing. Some 37 pages have been torn from the cash book. During the seven months for which the vouchers and accounts are missing the disbursements of the company amount to over \$2,000,000. It is shown that, according to the accounts, over \$3,000,000 in bullion has been taken from the mine in the last two years, and \$1,000,000 received from assessments; yet no dividends have been paid during that time. Business at the mine has been conducted in an exceedingly loose manner. A thorough investigation is to be made. The Justice company, through the attorneys, has commenced suits in this city against Schultz and Von Bargen to recover \$132,000, on two items, viz., \$60,001 in money of the company taken by the firm to pay an assessment of \$1 per share on 60,001 shares of the Woodville stock owned by the Justice, and \$72,000, money belonging to the Justice, admitted by Schultz to have been retained by him. The attachment suit covers all moneys deposited in the banks of San Francisco by defendants, and all stock known to be held by brokers for their account. It also covers the building on the corner of California and Front streets. There is an allegation in the complaint filed to the effect that the moneys unaccounted for by them will amount to \$500,000.

Outside of the excitement occasioned by the matters above referred to, the market has been pretty dull during the past week.

It is said that the reason no beef is being shipped to Europe at the present time is not that it does not arrive there in good condition, but because the London market is well stocked, the receipts from Ireland now averaging about 22,000 head of cattle per week.

THE Sub-Committee of the House Committee on Elections have concluded hearing arguments in the Louisiana, Massachusetts and California contests, but will not report upon them to the full Committee until after holding the recess.

MINERALS FOR PARIS.—Mr. J. Hatch has boxed for shipment some 10,000 mineral specimens for exhibition at the Paris exposition, and is engaged in collecting others. This collection attracted considerable attention at the Centennial.

Signal Service Meteorological Report.

Week Ending December 11, 1877.

HIGHEST AND LOWEST BAROMETER.						
Dec. 5	Dec. 6	Dec. 7	Dec. 8	Dec. 10	Dec. 11	Dec. 12
30.34	30.13	30.08	30.21	30.21	30.00	30.12
30.24	30.05	30.01	30.11	30.03	29.92	29.90
MINIMUM AND MAXIMUM THERMOMETER.						
57	67	55	53	53	59	60
46	47	49	43	43	43	40
MEAN DAILY HUMIDITY.						
63	65	69	74	65	73	76
PREVAILING WIND.						
N	NW	N	N	NW	W	N
WIND—MILES TRAVELED.						
154	93	84	114	135	114	80
STATE OF WEATHER.						
Clear.	Fair.	Fair.	Clear.	Fair.	Clear.	Fair.
RAINFALL IN TWENTY-FOUR HOURS.						
Total rain during the season, from July 1, 1877, 2.47 in.						

LEATHER.

(WHOLESALE.)

WEDNESDAY M., December 12, 1877.

Sole Leather, heavy, lb.	28 @ 29
Light, lb.	22 @ 24
Jodot, 8 Kil, doz.	48 @ 50
11 to 13 Kil.	65 @ 76
14 to 19 Kil.	80 @ 90
Second Choice, 11 to 16 Kil.	55 @ 70
Corrolian, 12 to 16 Kil.	60 @ 67
Females, 12 to 13 Kil.	63 @ 67
14 to 16 Kil.	71 @ 76
Simon Ultimo, Females, 12 to 13 Kil.	63 @ 62
14 to 16 Kil.	65 @ 70
16 to 17 Kil.	72 @ 74
Simon, 18 Kil.	61 @ 63
20 Kil.	65 @ 67
24 Kil.	72 @ 74
Robert Calf, 7 to 9 Kil.	50 @ 60
Kips, French, lb.	1 00 @ 1 35
Cal. doz.	40 @ 60
French Sheep, all colors.	8 @ 15
Eastern Calf for Backs, lb.	1 00 @ 1 25
Sheep Roams for Topping, all colors, doz.	9 @ 13
For Linings.	5 50 @ 10 50
Cal. Russet Sheep Linings.	1 75 @ 4 50
Boot Legs, French Calf, pair.	4 00 @ 4 75
Good French Calf.	4 00 @ 4 50
Best Jodot Calf.	5 00 @ 5 25
Leather, Harness, lb.	38 @ 38
Pair Brille, doz.	48 @ 72
Eastern Calf, 7 to 9 Kil.	33 @ 37
Skirting, lb.	30 @ 30
Well, doz.	30 @ 30
Buff, ft.	18 @ 20
Wax Side.	17 @ 18

Gold, Legal Tenders, Exchange, Etc.

[Corrected Weekly by SUTRO & Co.]  
SAY FRANCISCO, December 12, 3 P. M.  
LEGAL TENDERS IN S. F., 11 A. M., 97@97 1/2. SILVER, 41@42  
GOLD IN NEW YORK, 103 1/2.  
GOLD BARS, 89@90. SILVER BARS, 6@15 1/2 cent. dis.  
EXCHANGE ON NEW YORK, 1 1/2; on London bankers, 49 1/2;  
Commercial, 50; Paris, 5 francs 50 cent; Mexican  
dollars, 94.  
LONDON CONSOLS, 95 3/16; Bonds, 106 1/2.  
QUICKSILVER IN S. F., by the Bale, 40@47 1/2.

METALS.

(WHOLESALE.)

THURSDAY, M., December 13, 1877.

IRON.—		
American Pig, ton.	28 00	@ 32 00
Scottish Pig, ton.	28 00	@ 33 00
White Pig, ton.	28 00	@ 30 00
Oregon Pig, ton.	—	@ —
Refined Bar.	31 @	61
Horse Shoes, keg.	5 00 @	—
Nail Rod.	—	@ —
Norway, Oval.	—	@ —
Rolls.	—	@ —
COPPER.—		
Copper Tinned.	37 @	40
Sheeting, lb.	21 @	22
Sheeting, Yellow.	21 @	22
Sheeting, Old Yellow.	21 @	11
Composition Nails.	10 @	—
Composition Bolts.	24 @	—
STEEL.—		
English Cast, lb.	14 @	5
Anderson & Woods, ordinary sizes.	16 @	—
Drill.	16 @	—
Flat Bar.	15 @	18
Flow Steel.	8 1/2 @	12 1/2
TIN PLATES.—		
10x14 1/2 Charcoal.	8 50 @	9 00
Australia.	19 @	20
ZINC.—		
By the Cask.	11 @	—
Zinc Sheet 7 1/2 ft. to 10, lb.	11 @	—
7 1/2 ft. to 10, lb.	12 @	—
8 1/2 ft. to 10, lb.	12 @	—
8 1/2 ft. to 10, lb.	12 @	—
NAILS.—		
Assorted sizes.	3 00 @	25
QUICKSILVER.—		
By the lb.	47 1/2 @	50

GENERAL MERCHANDISE.

(WHOLESALE.)

WEDNESDAY M., December 12, 1877.

PAQS.—Jobbing.		
Eng Standard Wheat, 9 @ 9 1/2		
Neville & Co's		
Hand Sewed, 22x36, 9 @ 9 1/2		
24x36, 9 @ 9 1/2		
Machine Sewed, 22x36, 9 @ 9 1/2		
Flour Sacks, halves, 5 @ 10		
Quarters, 5 @ 10		
Eighths, 4 @ 10		
Hessan, 40 inch, 15 @ 41		
45 inch, 8 1/2 @		
40 inch, 8 1/2 @		
Wool Sacks.		
Hand Sewed, 3 1/2 lb., 42 1/2 @		
Machine Sewed, 42 1/2 @		
4 lb., 47 1/2 @		
Standard Gummies, 15 @		
Bean Bags, 6 1/2 @ 8		
CANDLES.		
Crystal Wax, 17 @ 17 1/2		
Eagle, 14 @		
Patent Sperm, 25 @ 30		
CANNED GOODS.		
Assorted Pie Fruits.		
2 lb. cans, 2 7/8 @ 3 00		
Table do., 3 7/8 @ 4 25		
Jams and Jellies, 4 25 @		
Pickles, 1 lb. gal., 3 50 @		
Sardines in box, 1 55 @ 1 90		
Ht Boxes, 3 00 @		
Preserved Beef.		
2 lb. doz., 4 00 @		
do Beef, 4 lb. doz., 5 00 @		
Preserved Mutton.		
2 lb. doz., 4 00 @		
Beef Tongue, 6 50 @		
Preserved Ham.		
Sardines in box, 8 50 @		
Deviled Ham, 1 lb.		
do, 5 50 @		
do Ham, 1 lb. doz., 3 00 @		
Australian, ton, 7 75 @ 8 00		
Coco Bay, 6 50 @ 7 00		
Bellingham Bay, 6 50 @		
Seattle, 6 50 @		
Cumberland, 14 00 @		
MT Diablo, 4 75 @ 5 75		
Lehigh, 22 00 @		
Liverpool, 7 00 @ 8 00		
West Hartley, 7 50 @ 8 00		
Scotch, 7 00 @ 8 00		
Scranton, 13 00 @ 16 00		
Vancouver Id., 7 50 @		
Charcoal, sack, 7 50 @		
Coke, hbl., 75 @		
COFFEE.		
Sandwich Id, lb., 21 1/2 @		
Costa Rica, 19 @ 19 1/2		
Guatemala, 19 @ 19 1/2		
Manilla, 19 @ 19 1/2		
Ground, in cs., 25 @		
FISH.		
Sac'd Dry Cod, 6 @ 6		
do in cases, 5 1/2 @		
Eastern Cod, 9 @ 10		
Salmon, hbls., 9 00 @ 10 00		
Ht hbls., 4 75 @ 5 25		
2 lb cans, 3 10 @ 3 20		
Pick Cod, hbls., 11 00 @		
Ht hbls., 11 00 @		
Mackerel, No. 1.		
Ht Hbls., 11 50 @ 12 00		
In Kils, 3 00 @		
Bay, Moss, 3 75 @		
Pick Herring, hbls., 3 00 @ 3 50		
Boston Smk'd Hg, 40 @ 50		
For Linings, Etc.		
hbls, Sta Cruz, 2 00 @ 2 25		
Cement, Rosen.		
dale, 2 75 @ 3 50		
Portland, 4 75 @ 5 50		
Plaster, Golden		
Gate Mills, 3 00 @ 3 25		
Laud Plaster, 10 @ 12 50		
NAILS.		
Ass'ted sizes, keg, 3 25 @ 4 00		
Pacific Glue Co's		
Neatfoot, No. 1, 10 @ 90		
Castor, No. 1, 10 @		
do, No. 2, 10 @		
Baker's A, 25 @ 30		
Oliver, Plagiol, 25 @ 75		
Possel, 4 75 @ 25		
Palm, lb., 9 @		
Linsed, 75 @		
Boiled, 80 @		
Cocunut, 65 @		
China nut, cs., 68 @ 70		
Sperm, 60 @ 65		
Coast Whales, 60 @ 65		
Polar, refined, 60 @		
Lard, 10 @ 15		
Oleophine, 27 @		
Devos's Bril, 29 @		
Photolite, 29 @		
Nonpareil, 50 @		
Eureka, 22 1/2 @ 25		
Barrel kerosene, 22 1/2 @ 25		
Downer Kerosene, 22 1/2 @ 23		
Elaine, 45 @		
PAINTS.		
Pure White Lead, 9 1/2 @ 10 1/2		
Whiting, 14 @		
Devos's Bril, 14 @		
Chalk, 14 @		
Paris White, 21 @		
Ochre, 34 @		
Venetian Red, 34 @		
Paint, Mixed		
White & tints, 2 00 @ 2 40		
Green, Blue & 20 @ 30		
Light Red, 30 @ 30		
Metallc Roof, 30 @ 30		
RICE.		
Cina No. 1, lb., 6 @ 6 1/2		
Hawaiian, 6 @ 5 1/2		
SAET.		
Cal. Bay, ton, 15 00 @ 25 00		
Common, 10 @ 12 00		
Carmen Id., 15 00 @ 20 00		
Liverpool Bay, 20 @ 28 00		
Castile, lb., 10 @ 10 1/2		
Common brands, 4 1/2 @ 6		
Fancy brands, 7 @ 8		
COVES, lb., 45 @ 50		
Cassia, 22 1/2 @ 25		
Nutmegs, 85 @ 90		
Pepper Grain, 15 @ 17		
Pimento, 15 @ 16		
Mustard, Cal.		
1 lb glass, 1 50 @		
SUGAR, ETC.		
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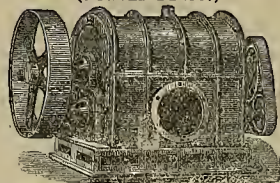
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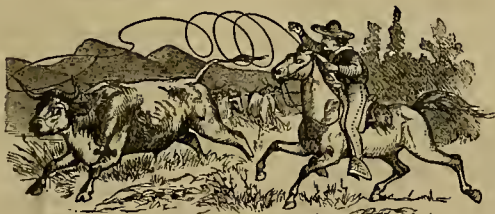
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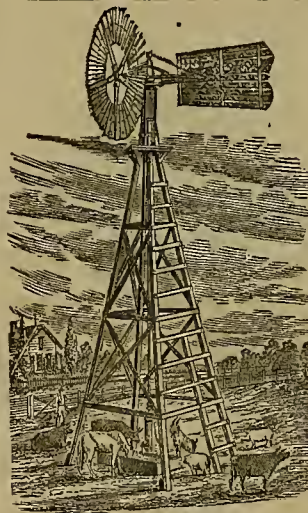
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Work was done under the supervision of the committee with each of the competing paints to test the working and covering qualities. Samples of each were subjected to chemical analysis by Professors Hilgard and Rising of the University, and it was found that the "Averill Paint" was composed of STRICTLY PURE WHITE LEAD, ZINC AND LINSEED OIL, and that these ingredients were united and held in solution by the addition of SILICATE OF SODA or "SOLUBLE GLASS," the value of which last named ingredient the committee takes special pains to notice and commend. Houses that had been painted with the Averill Paint for from one to seven years were

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# MINING AND SCIENTIFIC PRESS.

An Illustrated Journal of Mining, Popular Science and General News.

BY DEWEY & CO.,  
Patent Solicitors.

SAN FRANCISCO, SATURDAY, DECEMBER 22, 1877.

VOLUME XXXV.  
Number 25

## Stockholders and Mining Stocks.

The Governor of this State, in his message to the Legislature, has the following to say on this important subject: "There should be legislation to better protect the stockholders in mines from the mismanagement and rascality of the Directors. Mining is a legitimate business, is one of the largest interests of the State and is carried on now mainly through the agency of corporations. Those who invest their capital in mining stock for the purpose of developing and working mines are entitled to have the mines honestly worked and to reap the legitimate fruits of such investment of their capital. The laws should compel Directors to operate mines in the interest of all stockholders and not in the interest of an 'inside ring'."

"I venture to suggest, also, that the purchase and sale of mining stocks should be made a source of revenue to the State. The purchase and sale of mining stocks may be as legitimate business transactions as any other transactions which take place in the business community. When the purchases are made for the purpose of investment and with the expectation of receiving a return on the investment from the yield of the mines, they are of that character. But the great bulk of the transactions in mining stocks is quite independent of the character of the mines or of any expectations of a return on the capital invested from the yield of the mines. They are transactions wholly for purposes of speculation and are totally disconnected with the mining industry of the country. Without assuming to deny that these transactions have been productive of some good to the community, it is safe to assert, on the other hand, that no other occupation, not even that of gambling, has been productive of such terrible and widespread evils. A tax on the sales of mining stocks would be a legitimate source of public revenue and its imposition might be productive also of incidental benefits."

The Governor is perfectly right in his assertions, especially with reference to the speculative purchase of mining stocks made by persons having no interest whatever in the mines represented by said stock. As he states, the great bulk of transactions is made on this basis, and this is the greatest evil of the business, from which all the others spring. Such transactions are entirely outside the bounds of anything connected with the mining industry. As originally intended, the system of companies and shares was simple, so that each one should bear the expenses and reap the profits of mining ventures in the proportion of his interest. Unfortunately, this system, excellent in its intention, has become perverted so far that the original idea has been almost entirely lost sight of. Any one at all familiar with the subject knows that not one in a dozen of the dealers cares anything about the mines themselves aside from the value they give to the stock. They do not care whether mining is carried on legitimately or not so long as shares can be made to fluctuate.

That legislation is needed to protect stockholders in mining companies from the rascality of those in office, and who have supreme control of affairs, is perfectly apparent. The question is, how to legislate to get rid of the evils at present existing. A great difficulty is that most of those holding stocks know very little about mining, and they leave the management entirely to the Directors, who are not, unfortunately, always honest men.

One way to remedy some of the evils incident to the dishonest Director part of the business, would be to compel the Secretary of the company to keep a full and complete record of the business meetings of Directors, and that book should be accessible to any man holding a single share of stock in the company. The records of the meetings, or certified copies of such, should be placed in the office, where they could be examined any day. Make the laws stringent enough, so that on the discovery of any fraudulent entry, the Secretary and the one authorizing the change could be severely punished both by fine and imprisonment.

Then, again, an abstract from the books of the company could be made at least once a month, and oftener if necessary, and this should be

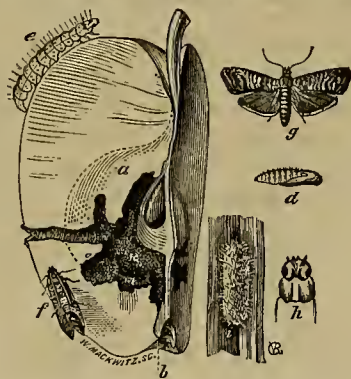
posted in the office so as to be accessible to any one, whether an owner of stock or one intending to purchase. This would have the effect of weeding out a good many "wild-cat" companies if the rule were rigidly enforced, and any infringement or falsification punished to the limit of the law. It would also prevent a great deal of swindling, for the misrepresentation of one man could scarcely get money out of others; it would require all the officers to be in collusion to deceive persons who desire to buy stock. There is no reason why one should not know the status of a mine as he does that of a piece of property when he is going to buy it.

An enforcement of regulations such as these, although they might give a little mine trouble to the officers, would do much to protect the stockholders who invest their money where half a dozen men have supreme control of it, as in the case of Directors of mining companies. A thorough discussion of this subject will no doubt bring out many suggestions which would be beneficial to all concerned except those who are wrongfully making money under the present system.

## The Codling Moth.

As this pest is making California fruit growers conscious of its presence, we have secured an engraving from the drawings of Prof. C. V. Riley, in order that all may become familiar with the appearance of the insect in its different stages, and recognize it. We also copy from Prof. Riley's reports some descriptive notes.

The following figures represent the apple worm (*Carpocapsa pomonella*) in all its states, and gives at a glance its natural history: *a* represents a section of an apple which has been attacked by the worm, showing the burrowings



Transformations of the Codling Moth.

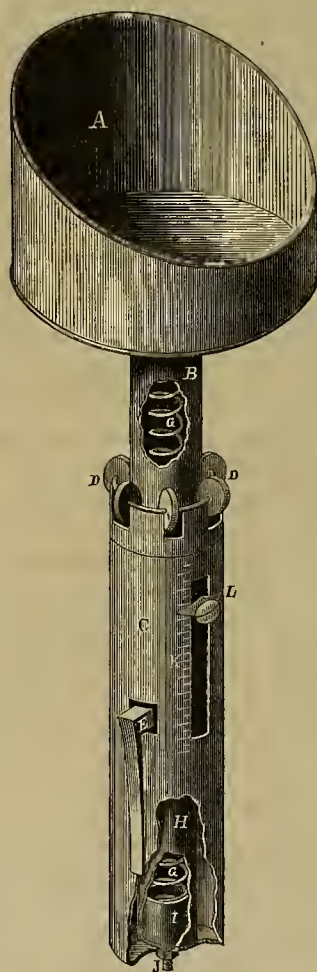
and channel of exit to the left; *b*, the point at which the egg was laid and at which the young worm entered; *c*, the full grown worm; *d*, its head and first segment magnified; *e*, the cocoon which it spins; *f*, the chrysalis to which it changes; *g*, the moth which escapes from the chrysalis. The worm of the codling moth, when young, is whitish, with usually an entire black head shielded on the top of the first segment. When full grown it acquires a flesh-colored or pinkish tint, especially on the back, and the head and top of first segment become more brown, being usually marked as at *h*. It is sparsely covered with very minute hairs which take their rise from minute elevated points, of which there are eight on each segment. The cocoon is invariably of a pure white color on the inside, but is disguised on the outside by being covered with minute fragments of whatever substance the worm happens to spin to. The chrysalis is yellowish brown, with rows of minute teeth on its back, by the aid of which it is enabled to partly push itself out of its cocoon, when its time to issue as a moth arrives. The moth is a most beautiful object. Its fore wings are marked with alternate, irregular transverse wavy streaks of ash-gray and brown, and have on the inner hind angle a large tawny brown spot, with streaks of bright bronze color or gold.

A FAIR in Boston, this week, in aid of the old South church, realized \$36,000.

## Improved Weighing Scoop.

Michael L. Mery of Chico, California, has patented, through Dewey & Co.'s Patent Agency a novel combination scoop and weighing device, which we illustrate on this page. It consists in constructing a scoop or combination with a spring balance located in the scoop handle with scale and pointers on the handle, and a stop so arranged as to save the spiral balance spring from damage when the scoop is thrust into any hard, unyielding material.

The scoop, *A*, has its movable stem, *B*, sliding on the handle, *C*, and outside the spring case, *H*, as shown. The guides on rollers, *D*, serve to keep the stem in position, so that the spring may work free; also to prevent friction



Mery's Improved Weighing Scoop.

while weighing. A similar set of anti-friction rollers, *D*, are fixed to the lower end of the stem, so as to work between the outer and inner case *U* and *H*. A spring stop, *L*, is so arranged on the handle as to be directly under the thumb when the handle is grasped, and a slight pressure of the thumb on it when the scoop is thrust in the material, prevents the stem, *B*, from being pressed back. A spiral balance spring, *G*, plays within a socket or case, *H*, which fits inside the stem, *B*, and is made fast to the inside lower end of the handle.

A thimble, *I*, placed in the lower end of the socket, *H*, holds the end of the spring, and a nut and screw, *J*, in the end of the handle, operates upon this thimble and serves to adjust the tension of the spring. This screw, *J*, can be made hook-shaped and can be used to hang the scoop by when not in use.

A scale, *K*, is fixed on the handle and is graduated on both sides by a double pointer, *L*, one

side to ounces and the other to quarter pounds or any desired scale.

When the scoop is in use the handle is naturally grasped so that the thumb is directly over the stop, *L*, and a slight pressure on it when the scoop is thrust into any material prevents the stem from being pushed down upon the spring, and causing any damage to it. The combination of handle and stem is made stiff and unyielding by reason of the stop, thus facilitating the scooping up of any hard, unyielding material.

When the material to be weighed is raised up in the scoop, the stop is released and the balance, being free to act, the weight of the material will show on the scale. This arrangement of scoop and scale gives two useful articles in one, and is very serviceable where a large amount of material has to be divided by weight into small quantities. For further particulars, with regard to procuring rights or manufacturing, address M. L. Mery, Chico, Butte county, California.

## Gould & Curry.

The annual meeting of the Gould & Curry mining company was held on Tuesday. The Superintendent's annual report was read and received. From this it appears that during the past year an aggregate of 2,288 feet of drifts have been run on the 1,500, 1,700, 1,800 and 1,900 foot levels. On the last level a lateral drift has been run the whole length of the mine to the Savage joint winze, to give free circulation of air in the mine. A large amount of money has been expended in removing the old pumps and machinery and replacing them with new and more powerful appliances. New tanks have been put in, and all this work is completed and paid for. The mine has now one of the best pumping engines, with a line of 14-inch pumps, on the Comstock, and at present it is run at only one-third of its capacity. New boilers, etc., have also been built. Although no ore has been found on the lowest prospected level (the 1,700-foot), the crosscuts have been through favorable ground, and the Superintendent expresses the opinion that good ore will be found on the 1,900-foot level, the formation being such as is found in the vicinity of ore on the Comstock.

From the Secretary's report it appears that the receipts from assessments amount to \$429,763.82, and from other sources \$26,574.45; a total of \$456,338.17. The disbursements, including an old debt of \$108,603.45, amount to \$472,196.63, leaving the company \$15,853.46 in debt at the present time. The value of property owned by the company is stated at \$394,533. The reports were adopted and the following Trustees elected for the ensuing year: Charles H. Fish, George Congdon, Geo. R. Wells, Solomon Heydenfeldt, Robert Sherwood, R. R. Folis and W. S. Lyle.

Mr. Wells was elected in place of J. G. Fair, and Mr. Heydenfeldt to fill the vacancy caused by the resignation of Mr. Flood. Otherwise, there is no change in the Board. Mr. Fish was elected President; Mr. Congdon, Vice-President; Alfred K. Durhrow, Secretary, and F. F. Osbiston, Superintendent. It was voted to levy an assessment of \$1 per share on the capital stock, in order to pay off the indebtedness of the mine and prosecute the work of development.

NEW PATENT AMENDMENT.—The following is the full text of the bill introduced in the Senate by Barnum, to save the rights of patentees under Section 4,915 of the Revised Statutes: It provides that, "No patent which has been heretofore amended by introducing new matter into the specification and reissue under Section 53, Class 230, Statutes at Large, or under Section 4,916 of the Revised Statutes, shall hereafter be declared invalid by the United States, for the reason that a commissioner of patents was not authorized by said sections of said Statutes, in case of any patent of which there were neither model nor drawing, to admit proof that the new matter of the amendment was part of the original invention and was omitted from the specification by inadvertence, accident or mistake." Referred to the Committee on Patents of which Booth is Chairman.



## CORRESPONDENCE.

It is the desire of the editors of this journal to be liberal toward all correspondents, and therefore statements and opinions are frequently published, on the authority of the writers, for which we do not assume responsibility.

### El Dorado County Mines.

A More Prosperous Mining Era about to Open in this Region.

EDITORS PRESS:—In my last I related how almost wholly the business of gold mining had ceased in and around Coloma—how the thunderous roar of this industry, sweeping away to other localities, is heard but faintly now in the place of its nativity. Here and there some squads of Chinese are still to be seen, scavenger-like, rewashing the tailings, already often washed over, or patiently pushing their wing-dams out into the river, rescuing a portion of its bed for mining purposes, the indefatigable and ever present Mongol confining his labors mostly to this class of operations. The number of whites mining about Coloma is, however, small, and every year decreasing. But while gold mining has become so almost extinct in the neighborhood of this ever memorable locality, it is being actively and successfully carried on in other portions of the county, a gradual but very general revival of this industry having taken place in El Dorado county during the past year or two, a result due mainly to the several large canals that have here been in progress of construction, and some of which have only quite recently been completed.

This county is by no means deficient in mineral wealth, its resources in this direction being varied and abundant. It contains a great number of quartz lodes of good character, while in the matter of auriferous gravel banks and deep lying channels it is second only to Placer and Nevada. What has tended to depress placer operations heretofore has been the limited supply of water that, until lately, has been furnished to the mines, a difficulty that will now be wholly and permanently overcome through the final completion of the works above referred to.

Among these enterprises that of The El Dorado Water and Deep Gravel Mining Company

May justly be accounted the most extensive and important. This company was organized about four years ago, with a view to introducing into the gravel mines and upon the farming lands about and below Placerville a more abundant supply of water than they had before enjoyed, to which end this company bought out the water franchise, ditches and mining grounds of the old South Fork canal company, and also the rights and properties of several smaller companies, securing to them ditches aggregating nearly 150 miles in length, and in the construction of which about \$1,000,000 had been expended. The South Fork canal carried only 1,000 inches of water, and this was delivered on a level too low to allow of its being used in some of the best mining localities along the route, or to admit of its effective employment anywhere in hydraulic washing.

The company afterward, through purchase and location, added largely to their possessions, acquiring ownership to some 20 lakes situate near the summit of the Sierra Nevada, together with many eligible reservoir sites, nearly all of which have since been wholly or partially utilized. The water shed tributary to these lakes, the largest of which are the Glacier, Medley, Echo, Audrain, Twin and Silver, covers an area of 500 square miles, the primary sources of water supply consisting mainly of the higher peaks and slopes of the Sierra. By damming up their outlets the retaining capacity of these lakes could, at small cost, be more than doubled. In some cases these obstructing works and reservoirs have already been built. The construction of

#### Their Main Canal

Was commenced in the spring of 1874 and pushed with such energy that it was brought to completion in the fall of 1875, notwithstanding the obstacles encountered in its progress were manifold and formidable. The working force employed during this period varied from 1,000 to 1,200. This main trunk, which is 32 miles long, takes the water from the South fork of the American river at its confluence with Alpine creek and carries it thence to Sportsmen's Hall, 10 miles above Placerville, where it is turned into the various distributing ditches that conduct it to the mining localities where required for use. This trunk, which is five feet wide at the bottom, 13 on top and six feet deep, has capacity to carry 5,000 inches of water, and cost something over half a million dollars. There are along its line over three miles of fluming, with numerous deep cuts and tunnels through the solid rock, and massive supporting walls at some points over 60 feet high. The company have built 144 miles of distributing ditches, excavated altogether 200,000 cubic yards of rock and used over a million and a quarter feet of lumber, the total expenditure in the improvement of their property, outfitting of their expensive mining claims included, having approximated a million dollars. During the past two years they have made many additional

improvements, such as enlarging and increasing subsidiary ditches, constructing more reservoirs, introducing new hydraulic apparatus, opening claims, etc., a labor force of about 200 men having been employed mostly in work of this kind. They have also run a tunnel of 1,000 feet long through one of the high ridges of the Sierra to reach Echo lake and bring its water through on the western side of the mountain, their receptacle for water catchment covering altogether an area of 13,000 acres to a depth of 20 feet.

#### Their Future Plans

Embrace the building of a V flume from the lower end of their main ditch to Placerville or further on to the terminus of the railroad, should the track not be extended to Placerville, as is now expected, it will be in the course of another year. This flume will reach into the heart of a fine timber region, enabling the company to profitably supply lumber to the markets below at a reduced cost. After using what water they require upon their own claims they will have a considerable surplus which will be sold to other miners. They will also supply water for irrigating purposes, the most of it being such as have already been used for hydraulic washing, and can, therefore, be afforded at very low rates.

They have it in contemplation to run a tunnel through Spanish hill to serve as outlet for a tract of rich gravel owned by them at that point; also, the further damming of their lakes and the enlargement of reservoirs, not to mention divers other schemes of a practical and highly useful kind.

#### The Mines of this Company

Consist of the Excelsior tract, embracing 75 acres, on Coon hill, near Placerville; the White Rock, containing 100, and the Spanish Hill, containing 200 acres, besides various smaller claims, the whole aggregating 725 acres, all first-class gravel land. On some of these claims, which are well outfitted, washing has been in progress for the past two years with excellent results, the average earnings having been at the rate of 16 cents for every inch of water used. Being in better shape now than ever before, the net profits realized from these mines will increase rapidly hereafter.

The success of this great enterprise, in the face of so many natural obstacles, has been largely due to the efforts of Prof. Thomas Price and his associate, Luis A. Garnett, President and organizer of the company, both of whom, in the capacities of consulting engineers and financial agents, have rendered the company most valuable service. Prof. Price has been especially active in promoting this project, having great confidence in the ultimate results that would attend it. When others, appalled by the difficulties that presented themselves, faltered and were nearly ready to give up, this gentleman, impressed with the importance of the ends proposed to be reached, the feasibility of the scheme and the great future that awaited its completion, exerted himself successfully to keep the work in progress and finally engineered it to a fortunate termination.

While the ditch above described delivers most of the water used on the Placerville divide, there are

#### Several Smaller Works of this Kind

That contribute materially towards that end, the largest of these being what is known as the Eureka ditch, capable of carrying about 2,000 inches of water, the most of it taken from the North fork of the Cosumnes and delivered in the mining camps along the southerly and westerly borders of the county. Much of this water is also used for irrigating purposes. It is a valuable and productive property, provided with reservoirs, sub-ditches, etc. Altogether there are about 50 different ditches in the county. They have a total linear extent of nearly 1,000 miles, carry in the wet season something like 12,000 inches of water and must have cost originally not less than four or five million dollars.

On this, known as the Georgetown divide, the main source of water supply is

The Canal of the California Water Company;

An extensive and costly work, commenced in 1872, and still unfinished in some of its details, though the principal ditch has for several years been completed. This is a San Francisco company, incorporated with a capital of \$500,000, and embraces among its larger shareholders some of the most enterprising and sterling business men of the metropolis, James P. Pierce, the great Smartsville gravel miner, being President of the company. Their properties consist of water franchises, ditches, mining, agricultural and timber lands, sawmills, etc.; all these different branches of business being actively prosecuted by the company. The most of their water is obtained from a system of lakes of glacial origin, stretching along a basin-like depression called the Valley of the Rubicon—being the South fork of the Middle fork of the American river, and situated at a great altitude on the westerly declivity of the Sierra Nevada. Tributary to this basin is the Little South fork, also glaciated and full of small lakes. The most of these lakes are very deep, some being also quite large, the catchment capacity of all being susceptible of great enlargement by means of damming up their outlets. This water is brought upon the mines and agricultural lands, which cover the entire divide, by means of a system of ditches having an aggregate length of over 300 miles, and capacity to deliver about 16,000 miners' inches of water. This company, in addition to its purchase price, have expended some \$400,000 in the improve-

ment of their property, which is one of the most valuable and carefully managed of any in the State, notwithstanding it has failed to return the profits counted upon at the outset. When this enterprise was inaugurated great calculations were made upon the "seam mines," a marked feature of the auriferous deposits on this ridge and which, at that time, were attracting much attention, it being generally believed that they would prove very remunerative. Being somewhat disappointed in this source of revenue the income of the company has been temporarily curtailed. But this has caused them no special embarrassment, having had the effect to merely postpone the great success that in a year or two may be expected to richly reward their well-directed endeavors. Their water franchise is one of exceeding value, and, like the most of these properties in California, must appreciate steadily in the future. If labor is to be king on this coast water will be its prime minister. Even the precious metals will have to accept positions subordinate to this element in the coming empire of industry. Wise above all others are the men who secure the water, for this must become very soon the key to wealth and power. Even though these properties yield but small earnings at first they will pay a larger percentage than any other class of investments in the end.

H. D.

### Trees and Rainfall.

No. 5

(Written for the Press by SAMUEL PURNELL.)

#### Consumption of Grass by Sheep.

Undoubtedly one of the leading causes of the increasing dryness of southern California is the almost complete destruction of the grass by sheep. Wherever a herd of sheep grazes, the grass is entirely consumed, as though a fire had swept over it and with the same results; it grows green no more that season. The grass upon the mountains of central and southern California has been thus destroyed. Often the very roots are killed and the soil in many places has become barren. The islands off the coast have been converted into sheep pastures, and the grass upon them, except during the period of winter rains, has disappeared and the desert cactus alone flourishes. Even in the high Sierras, where, as the summer draws on, they are driven from the exhausted hills below to escape starvation, almost everything green within their reach is devoured. They destroy the plants and undergrowth upon which insects depend, so that even the birds have now disappeared from the sheep-grazing mountains.

In the midst of this desolation and increasing dryness a few individuals prosper by raising sheep, but the halaucc of the people are sorely suffering thereby and their posterity will be extinguished. Sheep raising upon a large scale, where 6,000,000 of sheep filch their living from the public mountains, as is the case in California, should not be tolerated by a wise people. The safety of the public should be the supreme law. Mountains cannot become newly wooded; no young trees can grow as long as trespassing sheep are permitted to eat them. Sheep should only be allowed when the owner keeps them in inclosed fields and raises the grass for their subsistence. As long as public sentiment tolerates the present gross violation of its vital interests, so long will selfish persons keep the mountains stripped of every green thing, and the dryness will increase and the rains grow less and the sands of the desert spread still further, till neither men nor sheep can survive. Scarcely one person in a hundred in this State is interested in sheep or wool; the many suffer for the benefit of the few, the productivity of the country is arrested and its climate and soil undergo a change from fertility to desolation. In view of this it is within the bounds of moderation to assert that the presence of sheep in large numbers, as they are kept in California, is actually a curse to the country.

No one can say with certainty that the

#### Great Valleys of Central California

Have been covered with forests within the historic period, but it seems probable that they have not been wooded for at least several hundred years. If we may rely upon evidence that is somewhat unsatisfactory, we may affirm that surely within the present geological epoch, and within the historic period and since the discovery of America, the great valleys, as well as the Coast Range, have teemed with forests. How these trees were destroyed we may never know, but, as there is no reason to believe that they were destroyed by cosmic causes, we may assume that the California valleys and coast forests were, as has universally been the case elsewhere, sacrificed upon the altar of man's hate, greed and ignorance; or, at least, that man began the work and outraged nature finished it. When these valleys were wooded, and the Coast Range upheared its evergreen forests, summer showers were frequent, the streams ran high in their banks, and the green grass waved all summer in the cool and moist breezes. Now, except on the northern part of the Coast Range, we find no forests till we come to the Sierras; these to a height of some 8,000 feet are in most places well covered with groves of manzanita, oak, nut-pine and coniferous trees, and much rain falls upon them in winter, sometimes a very little in summer. If trees produce rain, it may be asked why the high and well wooded Sierras do not enjoy

abundant summer rains. It may be doubted that the

#### Influence of the Northwest Trade

Extends to the summits of the central Sierras; the cool wind that blows across the Coast Range is never felt upon the high Sierras. The trade wind blowing over the treeless and hot soil of the Coast Range and encountering the furnace heat of the great valleys—lacking only sand to constitute them true deserts in summer—is elevated to so high a temperature, and ascends to so high an altitude, that it either blows over the summits of the Sierras, or its force becomes spent and the wind becomes lost in the upper air. Thus, by reason of the barren Coast Range and hot valleys, the trade wind can produce but little summer rain in the Sierras, and the forests of those mountains are chiefly useful to increase the quantity of winter rain. To secure summer rains upon the valleys and the coast, the trade wind should be cooled below its dew point immediately upon its striking the coast and while it passes over the Coast Range, then it would deposit a large share of its moisture—perhaps a third—upon the coast and the interior valleys. There is only one way to accomplish this, and that is to cool the soil and wind by means of forests. There are other reasons, beyond mere refrigeration, why trees produce rain, which will be noticed hereafter. In the

#### Northern Part of California,

Where the interlocking spurs of the Coast Range and the Sierra Nevada cover that portion of the State and give it a broken and rugged character, there are some extensive growths of redwood trees, but these forests are neither of the right kind of timber nor of sufficient size to precipitate the summer rains. Their best use is to cause a copious rainfall in winter, and that section, because of its trees, receives a rainfall two and three times greater than that of the vicinity of San Francisco.

Thus far in our remarks, little has been said upon what is termed

#### "The Crime Against Posterity."

This crime, unpardonable and unforgivable and which can only be expiated, consists in the wanton destruction of the forests which nature has planted and nourished and without which man can neither enjoy lasting health nor wealth nor transmit to his posterity an inhabitable country. It consists also in the neglect to plant trees to replace those destroyed by the actual necessities of civilization, thus entailing upon his posterity an inheritance of desolation. To an individual actuated by mere selfishness, it is not conceivable how man is subject to obligations outside of his personal pleasures and necessities and impelled by a sense of duty to leave things better than he found them. With the right thinking man there can be no question of his duty to those who are to follow him; he feels that it is not only his duty to transmit the productivity of a country in as advanced a state for the sustenance of life and the health and development of the human race as he found it upon his terrestrial abode, but he realizes that he has a duty to endeavor to transmit to posterity a better and more perfect inheritance of health, wealth and development than he himself received. If one feels that he has no duty to perform to society, has no enthusiasm to reform abuses, burns with no desire to improve the existing order of affairs, is conscious of no obligations to posterity, such person is deficient in the moral qualities, is no better than a savage and the world is poorer for his having lived. Man is improved in his condition and rises in the scale of progress and noble development mainly by the pains and labors and sufferings of his predecessors. A single generation makes no sensible advance. We are the posterity of our forefathers. Almost all we enjoy we owe to their toil and aspirations, and one who shrinks from performing his duty to his successors, making the selfish plea that he owes nothing to posterity as posterity did nothing for him, is unworthy of the age in which he lives, is an ignorant and selfish savage and will receive the reward of his evil nature in corporeal and spiritual annihilation. Aside from this, no man in the pursuit of selfish and temporary purposes has any natural right to destroy a forest, to lessen by a single acre the amount of rain-producing substance and thereby destroy the fertility of a district. Society at large and posterity have an interest in the perpetuity of the forest greater than any government or any one called "owner" or any mere set of men can possibly have. At present the owner, so-called, of woodland may, of his own volition, for pleasure or malice, slay a forest which took a century to grow and is the rain producer of a fertile and prosperous valley. The small amount of money realized does no good to society, while that valley, with its thousand homes, becomes dry, a sandy desert and its people disappear. Would any one possessing the instincts of justice for a moment admit the natural right of the proprietor of that forest to produce this scene of desolation in pursuance of his private purposes, merely because man-made laws declare him "owner" and that he can do as he likes with his own? A distinction between the use and abuse of the rights of property should in such a case be sharply drawn; no one should in any case be permitted by law to so treat what he calls his own as to damage his neighbors or to infringe upon the clear right of posterity to receive the natural wealth of soil, forests and rainfall, unimpaired by its ancestry. Man has but a limited and temporary use of natural wealth and

(Continued on page 390.)



## MECHANICAL PROGRESS.

## Progress in Flour Milling.

A writer in the *Mill Stone* recounts in an interesting manner the many ways in which the modern art of flour making shows progress over that practiced a generation ago, but which is still in vogue in some mills. We extract a few points which are interesting and suggestive: The new process means a first-class steam engine, grinding the flour and heating the mill on a cent's worth of coal to the bushel of wheat. Where water power is used instead of steam, the new process means the use of turbine wheels, giving over 80% of the full power of the water, instead of the old breast-wheel giving only 50%.

The new process means nicely turned iron shafting and pulleys, with belt-gearing, in place of wooden shafts and cog-gearing with two or three old millwrights slashing around with sledge hammers to keep them wedged, and assisted occasionally by two or three millers making frantic efforts to start the break-downs. It also means closely jointed old stock burs, and plenty of them—36 inches in diameter for middlings, and from 42 to 48 inches for wheat, according to the hardness or softness of the wheat—all in perfect balance and true smooth face, and the lands thereof to be from one-third to one-fourth of the whole surface of the burs, instead of one-half as in by-gone time. It does not, however, mean any particular patent dress, the common equalizing dress is good enough; but it does mean that the furrows shall be smooth and straight in all directions, not less than two inches broad and deep enough at the eye to bury the largest grain of wheat, and about the fourth of that of the skirt, the draft of the feather edge to be one inch to the foot in diameter of the bur, and all furrows of the same kind to bear the same relation to the center and circumference, and also that the miller shall have the power and means to alter the speed of any run without affecting the remainder, *i. e.*, speed to be altered instead of draft.

To mill under the new process means that the chop shall roll instead of slide between the burs, or, in other words, the substitution of a system of granulation in place of grinding.

The old process or system that required a man to jump on the burs every 24 or 36 hours and slash them all over with a pick so as to make them cut 15 bushels of wheat an hour, and make 24 bushels of flour to the 100 bushels of wheat, is fast becoming obsolete.

Instead of this old-time system it is now required of the miller that the face of the burs shall be smooth and true, and if any high places develop themselves they must be gently touched by the hand of a master either with pick, diamond or emery wheel, and not more than six bushels an hour should be ground on a pair of burs, and this should be ground cool or not at all. Moreover, it should be ground high enough to take off a broad, clean hran, and to make one-half middlings, and finally, last, though not least, the substitution of the new process, as herein delineated in outline, means to realize 20% per bushel more out of the wheat than by the old style, and a showing of a good and satisfactory balance on the right side of the ledger at the end of the year.

## A Locomotive Set up in Three Hours.

The days of deliberate and long considered labor are departing and the substitute is work at lightning speed. The most remarkable feat on record in connection with locomotive building has been performed at the shops of the Michigan Central railroad at Jackson, Mich., where, it is alleged, two new engines were completely put together and set in motion in a few minutes less than three hours from the moment the naked boilers were hauled into the shop.

Thursday evening, November 15th, there stood in the Michigan Central yard at Jackson two locomotive boilers, complete in all respects, upon trucks, while within the shops were the levers, the valves, the cylinders, the connecting rods, the bolts, the nuts, the wheels, the frames and all the other pieces of machinery required to construct two perfect locomotives, all finished and ready for use, but not one of which had ever been fitted to its neighbor or subjected to any test or measurement other than those applied to every similar piece before being pronounced good and fit for service. A notice was given that these parts were going to be combined in two harmonious wholes, and that those persons who desired to see a locomotive put together in the shortest possible time were invited to be present on Friday morning.

At seven o'clock to the minute the shop doors were opened, the boilers hauled in and the two gangs of 14 men each sprang to their work. The spectators, numbering about 200 men, stood far enough away not to interfere with the workers, and the contest went on.

The jacks were applied, the huge boilers were raised and bolted on their frames, then they were placed on their wheels with all possible expedition, while simultaneously work was progressing on every portion of the machines, which were rapidly assuming perfect form. Water was let into the boilers, and even while the men were working at the grates the fires were kindled and the "infants" began to warm up for their work. All this time not an

unnecessary word was spoken and every man worked as though his very existence hung upon the uninterrupted prosecution and speedy completion of his task. Great drops of sweat gathered on their heated faces and trickled down in streams; but no thought of rest suggested itself to a man, and a feeling of anxious pride pervaded all alike, workmen, shopmates, officers and spectators. At last one of them is ready for the smoke-stack, and is pulled along the track until she stops beneath the one designed for her, which hangs above her. A few moments more and the last screw is turned, the last bolt is fastened, the engineer stands in his place, and in just two hours and fifty-five minutes from the time the signal to commence was given, the throttle is pulled and the first of the twins moves off completed, followed a moment later by her mate, amid the cheers of all who have been fortunate enough to witness the most wonderful feat ever known in the history of locomotive building.

In considering this extraordinary achievement, must not be forgotten that the most wonderful feature of the whole, is that no mistake of any kind was made, and that every portion was so perfect that there was not the delay of a second in fitting or adjusting.

We read also that at the Pennsylvania railroad shops, upper and lower, at Altoona employ 3,000 hands. With the facilities at hand an eight-wheeled hopper-bottom car can be constructed in an hour, and recently 112 of this class were turned out in a week of ten hours a day. An eight-wheeled box-car can be made in nine hours, including one coat of paint, and a passenger car can be built two days.

**WHAT A BOY DID FOR THE STEAM ENGINE.**—In his article in the *Popular Science Monthly*, on the growth of the steam engine, Prof. Thurston says that when the engine had assumed a form that somewhat resembles the modern machine, an important defect still existed in the necessity of keeping an attendant by the engine to open and shut the cocks. A bright boy, however, Humpfrey Potter, to whom was assigned this duty on a Newcomen engine in 1713, contrived what he called a *scoggon*—a catch rigged with a cord from the beam overhead—which performed the work for him. The boy, thus making the operation of the valve-gear automatic, increased the speed of the engine to 15 or 16 strokes a minute, and gave it a regularity and certainty of action that could only be obtained by such an adjustment of its valves. This ingenious young mechanic afterwards became a skillful workman, and an excellent engineer, and went abroad on the continent, where he erected several fine engines. Potter's rude valve-gear was soon improved by Henry Beighton, and the new device was applied to an engine which that talented engineer erected at Newcastle-on-Tyne in 1718, in which engine he substituted substantial materials for Potter's unmechanical arrangement of cords.

**A GAS GOVERNOR.**—*Iron* says: The constant variation in the pressure of gas acts prejudicially in several ways; in addition to the trouble of having frequently to regulate the flame at the burners, a large amount of gas passes through them unconsumed, whereby the quality or illuminating power of the light is impaired, and the atmosphere of the room made unhealthy, besides causing the meter to work irregularly. A simple governor, called the Imperial Regulator, which may be screwed on to any meter, has been especially designed to equalize the flow of gas, and so put an end to the above named difficulties. It governs the pressure of the gas so perfectly, that the cocks of the burners may be turned full on when the gas is lighted, not requiring any subsequent adjustment; and whether one light or 50 be in use, a quiet, steady light with full even flame is maintained, while a saving of from 15% to 20% is effected.

**COOLING WATER.**—A description of a simple contrivance for the rapid cooling of liquids, invented by M. Toselli, is described in *Les Mondes*. It consists of a cylindrical cup for holding any liquid into which may be plunged an inner goblet, shaped like an inverted truncated cone, and having a lid which rests on the outer cup. Putting 150 grammes of nitrate of ammonia in the inner goblet, filling it with cold water, and stirring it so as to hasten the solution, the temperature of the outer liquid is soon reduced at least 12° C.—22° Fahr. The salt may be used for an indefinite period, by spreading it on a plate after each trial, and exposing it to the sun until it crystallizes anew. The inventor prepares a salt which will lower the temperature 28° C.—50° Fahr.—in the warmest countries.

**HOW BIRDS FLY.**—At a recent meeting in England to discuss aerial navigation, it was laid down as the proposition of the Aeronautical Society that flight was merely a mechanical action, capable of imitation, that it was unassisted by air cells or other contrivances for effecting levity, and that the balloon as a means of locomotion was useless to man except in the way of wafage. The wing of a bird was a structure which for strength and lightness combined we had no present means of imitating. After referring to the wings of different birds, the lecturer deduced from accounts read before his society, that long-winged birds could not manipulate their wings properly until they were somewhat raised from the ground, and that to obtain power upon the atmosphere the birds made a run, heaping before them a mass of air nearly equaling their own weight.

## SCIENTIFIC PROGRESS.

## Spontaneous Generation.

At the last meeting of the San Francisco Microscopical Society, a paper was read by Mr. H. C. Hyde, summarizing briefly the issue as they now stand between the upholders and opponents of the theory of spontaneous generation. Mr. Hyde takes the sides of the opponents, relying on the results gained by Dallingier and Drysdale, of these results he said: In the first place, it is conclusively shown that some form of the monads emitted palpable germs, visible, however, only with the 1-50th inch objective, and when visible of the size of about 1-200,000th of an inch. Others were, exactly speaking, *viviparous*, emitting no germs, but opening to give birth to minute living forms, while another form of monad emitted germs which the highest magnification failed to resolve, but the presence of which was indisputably proven by results.

In the second place it was conclusively shown that the different adult forms were capable of surviving varying degrees of heat ranging from 61° (142° F.) to 80° (175° F.) C., while the remarkable fact was developed that the sporules or germs were able to survive a temperature of 148.88° C. (300° F.)

From these facts they claim, and justly, I think, that the assumption of Bastian and some others, that the germs of putrefactive organisms must perish in the same conditions that destroy the parent is erroneous.

While this has not been actually shown of bacteria (the sole organism upon which the theory of spontaneous generation has been constructed) it may be strongly inferred that the bacterian germs are too minute to be observed by our present optical appliances, and it must be remembered that the monads are as much putrefactive infusoria as the bacteria.

Bastian, from certain infusions, produced both monads and bacteria. To guard against the introduction of supposed germs, he sealed up his infusions while boiling, and then subjected them to a temperature of about 300° F. Upon opening his sealed flasks, after the lapse of a sufficient interval, he found living monads.

Those he found were absolutely destroyed at a temperature of 140° F.; and upon this result, he regarded the theory of spontaneous generation, or archeogenesis, as he terms it, established.

While Tyndall and others have proved negatively that under certain conditions of temperature, and the absolute exclusion of possible germs in the surrounding air, living bacteria were never found, it remained for Dallingier and Drysdale, with the aid of the microscope and a marvellous stock of patience, to actually see that in the case of a closely allied form there was a positive production of germs from living monads, and that these germs, but not the parent forms, absolutely survived a temperature as high as that to which Bastian ever submitted his subjects; and that, after passing through this fiery ordeal, these same germs were seen to develop into the living, parent form, and in one instance, at least, into one of the identical forms described by Bastian, thus illustrating, I claim, beyond the possibility of a doubt, the source of the latter's error, and adding another and most valuable piece of testimony to the general question.

**WHICH IS THE RICHEST, MORNING'S OR EVENING'S MILK?**—This subject has now been put to the test of chemical analysis, and the result is that the evening's milk is found to be the richer. Prof. Boedeker analyzed the milk of a healthy cow at different periods of the day. The Professor found that the solids of the evening's milk (13%) exceeded those of the morning (10%); while the water contained in the fluid was diminished from 89% to 86%. The fatty matter gradually increases as the day progresses. In the morning it amounts to 24% at noon 34% and in the evening 53%. The practical importance of this discovery is at once apparent; it develops the fact that while 16 ounces of morning's milk will yield but one-half an ounce of butter, about double the quantity can be obtained from evening's milk. The casein is also increased in the evening's milk from 24% to 23%, but the albumen is diminished from 44-100% to 31-100%. Sugar is less abundant at midnight (44%) and most plentiful at noon (44%). The percentage of the salt undergoes almost no change at any time of the day.

**DIVISION OF LABOR IN SCIENCE.**—St. George Mivart remarks on this subject: "The principle of the division of labor renders necessary the application of one man's almost entire energy to a more and more restricted field of scientific labor. Only intellectual giants can now hope for eminence in widely remote areas of study and research. To take an example from one science, men have not only almost ceased to be general zoologists, and become ornithologists, entomologists, etc., as the case may be, but we hear of lives being devoted to the study of small sections of natural orders, and that this naturalist is a *Carabidist*, (that is, devoted to that family of beetles termed *Carabidae*), and that a *Curculionist* (devoted to the long-nosed beetles termed *Curculionidae*), while a German naturalist has even published a quarto volume, with large plates and numerous tables, the whole being devoted to the anatomy of the lower part of the hindmost bone of the skull of the carp."

## Ice Water at the Bottom of the Sea.

## The "Challenger" Discoveries.

At the last meeting of the Liverpool Geological Society, Mr. T. Mellard Reade, read a paper in which he pointed out the geological bearings of the information gathered by the *Challenger* expedition by deep-sea soundings and dredgings. As is well known from these physical observations, the basins of the great oceans are occupied in their lower depths with ice-cold water extending over the whole northern and southern latitudes, and consequently under the equator. This, Mr. Reade considered to be a remarkable physical fact, and proved that the secular cooling of the earth must be exceedingly slow, as the heat of the earth, apparently, did not influence the temperature of these vast ocean tracks, which are fed with cold water from the poles. It was also pointed out that the temperature of the ocean, decreasing with the depth, was the opposite to that of the solid earth, in which observations in mines and wells prove a general but varying increase of temperature downwards, so that at a zone 3,000 fathoms from the surface the temperature of the water is at freezing point; while on the land, in cases where the increase is 1° per 60 feet, on the same zone the temperature would be considerable above that of boiling water. Not the least interesting of the discoveries announced is that of the ocean bottoms below 2,000 fathoms being occupied generally—nay, almost universally—with a deposit of red clay containing pieces of pumice and nodules of peroxide of manganese, together with sharks' teeth and ear and other bones of whales; while the depths not exceeding 2,000 fathoms are largely occupied with foraminiferal ooze. These facts, it was considered, truly inferred a very great age for the present oceans as, from a calculation which cannot be detailed here, Mr. Reade considers it will take a minimum of 20,000 years for a deposit of foraminiferal ooze of an average depth of one foot to accumulate over the whole of the area occupied by it; while the red clay, the result of the decomposition of volcanic products, must be an exceedingly slow accumulation, probably not at the rate of one-tenth that of the ooze, but this rate is at present difficult to calculate.

**SINGING MICE.**—The question as to whether mice sing has been revived. M. Prieur, says the *New York Tribune*, described before the Society of Acclimatization his experience in La Vendee in 1851-3. He had bought an old cupboard which happened to contain mice. About sunset the mice began to sing. By lubricating the doors and hinges of the cupboard, M. Prieur was enabled to open it in one instance without disturbing the song. He literally caught the songster in the act. It was an old mouse, which held its nose in air like a dog when howling. Its song was like that of a wren. M. Prieur seized the mouse in his hand, but afterward allowed it to escape. On subsequent evenings the singing was renewed. There were no birds in the house. The utterance of a less musical sound has latterly been discovered as a part of the capacity of the scorpion, on the authority of Mr. J. Wood Mason, and described before the London Entomological Society. The experiments were made at Bombay, by teasing two large scorpions, placed face to face on a table. The sound is stridulous, somewhat like that from scraping a stiff brush with the finger-nails. An anatomical examination showed that the insect is provided with an apparatus consisting of a scraper and a rasp; these appendages could be made to give sound when separated from the scorpions after death.

**STRANGE NOISES.**—On a distant island in the Bay of Bengal, according to a German scientific journal, quoted by the *Journal of Chemistry*, there is a phenomenon known as the "Barisal guns," which is often heard at the beginning of rain, and is like the sound of firing of cannon. It seems to have no connection with the season, and sometimes comes from the north, sometimes from the south or southwest. Mr. Beveridge, who has collected some data on the subject, comes to the conclusion that these sounds are atmospheric and connected in some way with electricity. Mr. Home, in his report on the villages of the Himalayas, describes exceedingly powerful noises heard in the early morning among the highest mountain peaks, which can neither be ascribed to avalanches, nor be otherwise explained by the natives. Above the town of Koimhat, in Madras, at an elevation of 4,000 feet, is a pond from which the Lirivani springs, and which the natives carefully shun, because frightful noises rise out of it and roll away among the hills. The pond is very deep. Some of the phenomena may be of electric, some of volcanic nature.

## REPORTED EXISTENCE OF GOLD IN PERSIA.

—At a meeting of the Geological Society of London on the 7th instant, a communication from the foreign office intimated that the Earl of Derby had received a dispatch from Her Majesty's Minister at Teheran, reporting that a mining engineer had arrived there from Berlin, who, at the request of the Persian government, had been selected by Messrs. Siemens to ascertain what foundation there was for the reported existence of a rich vein of gold in the vicinity of Zengani; that he had visited the locality and reported that auriferous quartz does exist, but that he had not yet succeeded in finding any vein or deposit of metal.



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all mankind have equal rights therein. A man is not permitted by law to burn his house in a crowded city or to fire a gun into a crowd; the latter is wisely declared to be malice against all mankind. How much less malice against all mankind exists when an ignorant and selfish individual destroys a forest, decreases rain, makes barren the once smiling face of nature, renders a land uninhabitable and shuts out future generations from their fatherland or dooms them to extinction? With a strange disregard of the economies of nature, the lessons of science and the teachings of history, showing the folly of a nation in permitting the absolute ownership of trees and forests, the woods of America have been held to belong absolutely to the owner of the soil, instead of holding them as a universal and common heritage for all the people and to be utilized only under proper restrictions. The loose public sentiment, ignorant of the wrong and danger that now tolerates it, does so to the loss and peril of the people. The principle of "the greatest good to the greatest number" is the only just one upon which to regulate forestry. A revision of the land laws is imperatively demanded; demanded because the folly and greed of so-called owners of forests are sacrificing them for private gain, limiting the life-sustaining rains and fast reducing the interior of this once lovely and fertile State to the awful solitude of a sandy and burning desert. Already the northern counties and the central foothills of the Sierras are receiving less winter rain and southern California has passed the bounds of producing any crop without irrigation. The dryness is increasing and can only be held in check and more rain be produced by a universal planting of forests. When a tree is felled upon the coast no young tree springs up to take its place, or if so, it soon dies of thirst or is eaten by starving sheep. The forest does not here spontaneously reproduce itself. It is the duty and interest of the public to protect itself against these abuses and imminent dangers or it will itself eventually perish. No mere public sentiment, no advice or sentimental appeals to duty, no warnings will avail to protect the trees of a country against the temporary necessities or greed of the owners or serve to secure the planting of new forests. The remedy must be a radical one, the forests must be the property of the Government and no private parties should control them, in so far as to be able to injure them, and new forests must be planted and maintained at the public expenso. No man should own a forest, but he should hold it of the Government for his use only while no waste is committed. Woodland should only be leased, never sold, and penalties of bodily punishment and forfeiture of the lease should be enforced against those committing waste. The issue is between fertility and a lovely climate, and an approaching desert. Rain and trees complement each other.

This may seem strange doctrine to advocate, in these days when society holds money to be the only thing valuable, and honor and duty to be of no particular worth, yet it is not so strange as that the public should calmly tolerate their own approaching but preventable extinguishment, that they should sit indifferently and stupidly by their half desertic fields and barren hills, not knowing the cause of the poverty and barrenness, or unwilling to adopt the only possible

#### Remedy for a Malady

Which is fast hurrying California down to a tomb of burning sand.

A vigorous government of the people, owning the woodland and leasing it in small lots for stipulated sums in lieu of taxes, would not only preserve the present woodlands, but would also cover the hills and mountains with new forests to the very summits. A most agreeable and beneficent change would result. Summer rains would then be assured, slight at first and of no immediate value, but as the trees grew, increasing in size, so would the summer rains increase in volume. The mountain grasses and shrubs, the vegetation of the valleys, would spring forth luxuriantly; the mountains would be ever verdant with foliage, the valleys ever smiling with flowers and fruit; the inland streams run ever full of living water, new streams and springs burst forth; irrigation would be everywhere unnecessary; the "alkali" would be dissolved; the sands covered with sods; the summer cold of the coast and the furnace heat of the interior would be succeeded by warmer weather on the one side and a cooler climate on the other; the interior summer climate, far from producing sickness and weakness as now, would be deliciously cool, adding increased strength and vitality; the violence of the trade wind upon the coast would be lessened; a healthier and more highly endowed generation of people than the present would soon be developed; the State would rapidly increase in population and all material resources; and no more desirable place for residence, health and advancement could be then found in the world than in California.

Most of these advantages could be attained in 50 years, did an enlightened public sentiment upon this question exist. But it does not exist; between ignorance of the danger of the approach of the desert and of the remedy; between selfishness and indifference to the rights of others, and of posterity especially, nothing will now be done. The human race advances most, and its experience is most valuable, when accompanied with suffering. The public must suffer still more before they can understand their rights and wrongs; before they can realize the extent of their dominion over nature in the production

of rain and the conquest of the desert; before they can unselfishly do good to others and to posterity. The Pacific coast is becoming dryer, but it must become almost entirely dry; the desert is approaching, but its sand must roll through every county; a large part of the State and adjacent territory is already a desert, treeless, waterless and uninhabitable, but it must remain so till, educated by suffering, the wisely directed labors of the people have regenerated it and converted it into a fragrant garden of the gods.

#### Mars and His Moons.

[Abstract of a paper read before the California Academy of Sciences by PROF. JOHN LECONTE.]

There is no member of the solar system, with the exception of our moon, which can be studied under such favorable circumstances as the planet Mars; for, although Venus, when in inferior conjunction, is nearer to us than Mars in opposition, yet Venus, at this time, turns her darkened hemisphere towards the earth. Moreover, although Mars does not appear so large an object in the telescope as Jupiter, yet he is in reality seen on a much larger scale, not only on account of his much greater proximity to us, but because, being likewise much nearer the sun, his surface is much more brilliantly illuminated, so that a much higher telescopic power can be advantageously employed. Accordingly, ever since the invention of the telescope, Mars has been a favorite object of observation. The largest and most powerful instruments have been employed to scrutinize this planet, and the varied physical details of its surface have been most carefully mapped by many astronomers.

When, therefore, it was announced, a few months ago, that the American astronomer, Hall, had discovered two satellites belonging to Mars, we ought not to be surprised at the astonishment with which the news was received by the scientific world. Moreover, there can be no question that for more than two centuries past astronomers have recognized the probability of the existence of satellites to this planet. In fact analogy would lead us to expect that Mars would be furnished with one or more moons; for, being situated at a greater distance from the sun than the earth, it seems more especially to need such luminaries to cheer its dark nights. Under the influence of these anticipations, the astronomers who have so carefully studied the physical features of Mars, have doubtless been looking for these satellites. In fact, many of them have contended that the failure to discover them is not by any means a conclusive proof of their non-existence; since Mars, being a very small planet, we might expect his moons to be proportionally small, in which case they might escape detection by the telescope. Thus, for example, the second satellite of Jupiter is only about the forty-second part of the diameter of the planet; and a satellite which would only be the forty-second part of the diameter of Mars would be about 100 miles in diameter. At the least distance of the earth from Mars a satellite of this dimension would subtend an angle of less than one-half of a second; so that even in the most favorable position of Mars, powerful telescopes might fail to reveal such an object especially if it do not recede far from the disk of the planet.

This state of doubt and uncertainty in relation to the question of the existence of Martial moons afforded legitimate game for the satirical writers of the last century. Thus, Jonathan Swift (more familiarly known as Dean Swift), in his "Gulliver's Travels," published about 1727, in giving an account of the extraordinary race of abstract philosophers who inhabited the "Floating Island" called Laputa, informs us that: "They spend the greater part of their lives in observing the celestial bodies, which they do by the assistance of glasses far exceeding ours in goodness. For, although their largest telescopes do not exceed three feet, they magnify much more than those of 100 with us, and show the stars with greater clearness. This advantage has enabled them to extend their discoveries much further than our astronomers in Europe; for they have made a catalogue of 10,000 fixed stars, whereas the largest of ours does not contain above one-third of that number. They have likewise discovered two lesser stars or satellites, which revolve about Mars; whereof the innermost is distant from the center of the primary planet exactly three of its diameters, and the outermost five; the former revolves in the space of 10 hours, and the latter in 21½; so that the squares of their periodical times are very near in the same proportion with the cubes of their distances from the center of Mars; which evidently shows them to be governed by the same law of gravitation that influences the other heavenly bodies."

About 25 years after Swift wrote the foregoing, that is in 1752, the celebrated Voltaire, apparently in imitation of "Gulliver's Travels", cuttingly ridicules the pretensions of the class of reasoners who found their conclusions upon analogy. In one of his satirical tales Micromegas, an imaginary inhabitant of Sirius, is supposed to make a voyage of discovery through the solar system in company with a denizen of Saturn; they philosophize as they go. Approaching the planet Mars, Micromegas and his companion plainly described two moons acting as satellites to that body—moons which have certainly escaped the ken of terrestrial astrono-

mers. "I know perfectly well," continues the author of the tale, "that Father Castel (an astronomer of the time) will write, and write sufficiently pleasantly, too, against the existence of these two moons; but I appeal against his decision to logicians, who reason from analogy. These excellent philosophers are perfectly aware how difficult it would be for Mars—a planet so far removed from the sun—to get on with less than two of these satellites." (Œuvres de Voltaire—Micromegas, Chap. 3.) How completely the recent discovery of the American astronomer has "turned the tables" on the renowned satirist of the last century! The provisions of those "excellent philosophers" who founded their conclusions upon analogical reasoning, although slumbering in the domains of the unproven for more than two centuries, have at last been verified by direct observation. Why the Discovery of the Satellites was not Made Sooner.

As the moons of Mars are very small objects, it is only under the most favorable circumstances that they can be seen by the most powerful telescopes. Mars is nearest to us when his position occurs when he is near his perihelion; and the greatest possible proximity to us occurs when Mars is in opposition in perihelion and the earth is in aphelion at the same time. The oppositions of Mars near perihelion occur at intervals of 15 and 17 years successively. A very good opposition occurred in 1862; and a great many distinguished astronomers embraced the opportunity of scrutinizing Mars with the aid of excellent instruments. A still more favorable opportunity was presented in the summer of 1877, when Mars was nearer to us than it has been since 1845. It was at this time that Prof. Asaph Hall was fortunate enough, by means of the new 26-inch refractor of the Naval Observatory at Washington, to discover two moons belonging to this planet. It is true that this was probably the first time that so powerful a telescope had ever been directed to the examination of Mars under similar favorable conditions; yet, it is a significant fact, that since the announcement of the discovery the satellites have been detected by means of telescopes of more moderate power. The secret of Prof. Hall's discovery seems to have consisted in devising the means of cutting off, from the field of view of the telescope, the glaring light of Mars. In like manner, M. Henry, of the observatory of Paris, on the 27th of August, 1877, was able to see the satellites when Mars was screened from view. These diminutive moons nestle so closely to the planet that it is difficult to see them in the blaze of light reflected from Mars. Had similar means of screening the planet been employed, it is probable that one or both of these satellites might have been discovered in 1862.

#### Distances of Satellites from the Center of Mars.

The distance of the inner satellite from the center of the primary is about 2.73 times the radius of Mars; that of the outer one about 6.846 times the same radius. Assuming the diameter of Mars to be about 4,200 miles, these distances become, respectively, 5,733 and 14,376 miles from the center of Mars. The nearest satellite of Jupiter is distant about six times the radius of the primary, and the innermost satellite of Saturn is distant a little more than three times the radius of that planet.

#### Periods of Sidereal Revolution of the Satellites of Mars.

Prof. Newcomb gives, for the period of revolution of the inner satellite around Mars, about 7.65 hours, or 7h. 39m., and 30.25 hours, or 30h. 15m. as that of the outer moon. Both of them, like our moon, revolve around the primary from west to east. Mars rotates on its axis from west to east in 24.623 hours, or 24h. 37m. 23s.; this is the duration of the Martial day, or the time occupied by a star rising in the east in passing over to the western horizon of the planet. We have seen that the period of revolution of the inner satellite is less, while that of the outer is greater, than a Martial day. It is evident, therefore, that, as seen from the surface of the planet, the apparent motion of the satellites will be in opposite directions, the inner rising in the west and setting in the east, the outer (like our moon), rising in the east and setting in the west. This anomalous condition of things must have greatly perplexed the primitive astronomers of Mars, and probably led them to the invention of cycles and epicycles to account for these appearances.

It follows that the phenomenon of two moons meeting in mid-heavens will be no unusual occurrence to the observers on the surface of Mars. The apparent motion of the fixed stars from east to west, produced by the rotation of the planet upon its axis, is at the rate of 14.62° per hour. The real motion of the inner satellite among the stars from west to east is at the rate of about 47.06° per hour, while that of the outer one is at the rate of 11.90° per hour. Hence it follows that the apparent motion of the inner satellite from west to east across the heavens to an observer on Mars, will be at the rate of about 32.44° per hour, while the apparent motion of the outer moon from east to west will be at the rate of nearly 2.72° per hour.

It likewise follows from the preceding calculations that the time elapsing between two successive meridian passages of the inner satellite will be about 11.09 hours, and the time elapsing between two successive conjunctions of the inner with the outer moon will be about 10.24 hours; consequently two conjunctions will occur in less time than it takes for Mars to rotate on

its axis, or than a Martial day. This satellite completes more than three orbital revolutions in a Martial day.

As the apparent motion of the outer satellite from east to west is at the rate of only about 2.72° per hour, it is obvious that the time elapsing between two successive meridian passages of this moon will be about 132.35 hours; so that there will be no less than 12 conjunctions with the inner moon in the course of a lunar day. It is likewise evident that the outer satellite will frequently be above the horizon of Mars more than 60 hours, during which period six conjunctions with the inner may occur. Moreover, as the outer moon will go through its cycle of phases in a little more than 30 hours, all of these changes may be accomplished while it is above the horizon of the observer on the surface of Mars.

#### Apparent Magnitude of Mars as Seen from His Satellites.

The apparent diameter of Mars, as seen by an observer on the inner satellite would be no less than 41.8", or about 78½ times the apparent diameter of the sun as seen from the earth; and from the outer moon the diameter of Mars would subtend an angle of 16.7", or about 31.3 times the apparent diameter of the sun as seen by us. Of course the apparent areas of the disk of Mars, as seen from his two satellites, would be in the ratio of the squares of these numbers. That is, the apparent area of the disk of Mars, as seen from his inner moon, would be 6,167, and from the outer 980 times the apparent area of the solar disk, as seen from the earth.

From the innermost satellite of Saturn, the diameter of the primary would subtend an angle of 35.8"; from the nearest satellite of Jupiter, the diameter of that planet would subtend an angle of 18.6"; and from our moon the earth's diameter would subtend an angle of less than 2".

#### Apparent Magnitude of His Satellite as Seen from Mars.

Astronomers are, as yet, ignorant of the real magnitude of the Martial satellites; but, assuming each of them to be 100 miles in diameter, it is easy to calculate their apparent magnitudes as seen by an observer on Mars. The inner moon being 5,733 miles distant from the center of Mars, would, when in the zenith of the observer, be only 3,633 miles distant from the surface of the planet. Hence it appears that when this satellite is seen in the horizon of the observer on the surface of Mars, its diameter would subtend an angle of about 60m., or nearly twice the apparent diameter which our moon presents to us; but, when it is in the zenith of the observer, it would subtend an angle of 94.3m., or more than three times the apparent diameter presented by our moon. In other terms, in rising from the western horizon to the zenith, the apparent diameter of this moon would be increased nearly in the ratio of two to three; and, of course, its apparent area would be augmented nearly in the ratio of four to nine.

The outer satellite would, under like positions, present apparent diameters respectively, of 24 and 28m., or considerably less than the apparent diameter of our moon. The nearest satellite of Jupiter (having a diameter of 2,310 miles) would, in like positions, present to an observer on the surface of that planet apparent diameters, respectively of 31m. and 37m.

#### Bearing of the Discovery of Martial Satellites on the Nebular Hypothesis.

As we have seen, the inner satellite of Mars completes three orbital revolutions in less than a Martial day. "This anomalous fact in the planetary system would seem, at first view, to be utterly inconsistent with the nebular hypothesis." According to this hypothesis, the orbital periods of the satellites should be approximately equal to the rotation periods of the primary at the epochs when the satellites were thrown off from it. The acceleration of the rotation period of the primary, in consequence of its subsequent contraction, would necessarily render its time of rotation less than the orbital period of any satellite. As far as yet known, the inner satellite of Mars affords the only instance in which the rotation period of the primary is greater than the orbital period of the secondary.

It must be remembered, however, that if we regard the rings of Saturn as composed of clouds of independently-revolving minute satellites, those constituting the innermost portions of the inner ring must revolve in less time than the rotation period of that planet. Under this view, therefore, the case of the inner satellite of Mars is not unique.

There are, however, several methods by which the apparently anomalous fact may be accounted for consistently with the nebular hypothesis.

1. In the first place, it has been suggested that Mars may not have obtained his satellites by means of the usual process of moon formation; but by the appropriation to himself of a couple of the numerous asteroids or planetoids, some of which, in their perihelion excursions, approach comparatively near to Mars in his aphelion positions. Thus, the planetoid called Phocæa, when it is at its least distance and Mars at his greatest distance from the sun, would only be about 11,000,000 of miles from each other. It is, therefore, possible that some of the planetoids, moving in orbits of greater eccentricity than any yet discovered, may, at some former period, have approached so near Mars as to have become permanently attached to it as satellites.

2. In the second place, it is possible that these Martial moons may have originally re-



volved in larger orbits, and therefore in longer periods than at present; but that the retarding influence of a resisting medium on such small masses, night, in the course of myriads of ages, have contracted their orbits and consequently shortened their orbital periods. In this connection it must be borne in mind, that, according to the nebular hypothesis, Mars must be a vastly older planet than the earth; so that this retardation may have been in progress for an incalculable number of centuries before the earth became a separate planet.

3. In the last place, it is possible that Mars may have originally rotated on his axis in five or six hours; but that the tidal rotation-retardation produced by the action of his moons might have brought about its present rotation period. It is evident that the solar tides, on a planet so small and so remote from the sun, must be inappreciable; and, at first sight, the lunar tides produced by such small masses might be supposed to be equally insignificant. But it must be recollected that the tide-generating power of a moon is (other things being equal) inversely proportional to the cube of its distance; so that nearness might more than compensate for smallness of mass. To be more specific: In the mathematical language the tide-generating power is in proportion to the

Diameter of Primary  $\times$  Mass of Satellite  
(Distance of Satellite).<sup>3</sup>

Thus, for example, let us suppose the diameter of our moon to be 20 times the diameter of the inner satellite of Mars, and both moons to be equally dense; then the mass of our moon would be 8,000 times that of the Martian satellite. Taking the diameter of the earth as equal to twice the diameter of Mars (and it is not so great), and the distance of our moon from the center of the earth to be  $4\frac{1}{2}$  times the distance of the inner satellite from the center of Mars; we then have the tide-generating power of our moon acting on the earth, will be to that of the

inner satellite acting on Mars as  $\frac{2 \times 8000}{(4\frac{1}{2})^3}$  to 1,

or as  $\frac{16000}{71473}$  to 1, or as  $\frac{1}{4\frac{1}{2}}$  to 1, or as 1 to  $4\frac{1}{2}$ .

Hence, the tide-generating power of this small satellite, would, in consequence of its nearness to Mars, be about  $4\frac{1}{2}$  times as great as the tide-generating power of our moon on the earth.

In connection with the idea of the rotation period of Mars having, at some former time, been much shorter than it is at present, it may be noticed that the great compression or ellipticity of this planet is totally inconsistent with its observed rotation period. Most astronomers estimate the ellipticity of Mars at from

$\frac{1}{40}$  to  $\frac{1}{60}$  (although some of them have

failed to detect any sensible difference in his equatorial and polar diameters); the ellipticity of the earth is only  $\frac{1}{300}$ . Might not this great

ellipticity of Mars have been the result of solidification having taken place when its rotation period was much shorter than it is at present? This explanation is not free from serious difficulties. For, if aqueous and aerial agencies were in action after solidification took place, they would have tended to make the shape of the planet conform to its new rotation period. Berkeley, Dec. 3d, 1877.

**HYDRAULIC MINING.**—The article on this subject from the pen of the well-known engineer, Aug. J. Bowie, Jr., which is now being published in the PRESS, is an especially valuable one, and our hydraulic mining friends will find it alone worth more than a year's subscription to the PRESS. The facts and figures given by Mr. Bowie are of great value as showing the results of practical work. A reliable article of this kind is more profitable for miners to read and study than any other class of literature. We advise those who do not usually file away the PRESS to commence keeping their numbers now and they will have this standard article as a whole. It has been carefully revised and corrected by Mr. Bowie and comprises the whole literature of hydraulic mining in California.

**SACK PRESERVING.**—A North German paper states that corn and other sacks may be effectually prevented from rotting, and otherwise made to do duty much longer than usual, by simply soaking them in a solution of oak-bark tan. The quantities recommended are two pounds of tan in 17 or 18 pints of boiling water, the clear solution being strained off after it has stood an hour. In this the sacks should lie for 24 hours, and then be well washed in fresh water and carefully dried.

**SINGLE RAIL LINE.**—The *Railway Age* says: The single rail principle seems not unlikely to come into somewhat extended use for short roads, particularly in hilly regions, where a graded road-bed would be expensive and difficult on account of sharp curvatures. A road on this plan is being built in the Bradford oil district of Pennsylvania, and a car has been constructed for it running on two wheels, with two small wheels on each side to maintain it in position.

## USEFUL INFORMATION.

**WOODEN MONEY.**—Advocates of inconvertible paper currency may perhaps derive some satisfaction and encouragement from the fact that from the reign of Henry I. down to the period of the establishment of the Bank of England the legal tender money of England was fabricated out of wood. This instrument was called an exchange tally, and by virtue of it the holder was entitled to receive from the Crown the value inscribed thereon. It really consisted of one-half of a four-sided rod or staff, on which, when in its entire state, the sum it purported to represent was carved in transverse notches, varying in width for thousands, hundreds, scores, pounds, shillings and pence. These signs were for the unlearned; for the advantage of those who could read, the sum was written in ink on two opposite sides of the staff, and, finally, with a knife and mallet the staff itself was split in two, longitudinally. One-half, called the tally or check, was given to the person for whose service it was intended; the other half, called the counter tally, was laid up in safe-keeping until its corresponding tally should be brought in by the person who had last given value for it. Its intrinsic value was, of course, only that of the wood of which it was composed, but by representation it denoted large sums. It was a current token of real money, and served actually to distribute it from man to man by exchange. From this primitive tally was derived the Exchequer bill, first introduced in 1696, by Mr. Montague, then Chancellor of the Exchequer. The word "Bill," too, was no doubt obtained from the Norman-French word, *bille*, which means a staff. Bank post bills and bills of exchange in our own day came from the same wooden base, and soldiers are said at this hour to be "billed," because formerly they tendered wooden "bills," or tallies to the victuallers upon whom they were quartered. In olden times officers of the army were taken into the king's own pay, were said to be put on the staff, that is they were paid with Exchequer tallies, or wooden money. —*British Trade Journal*.

**SHAVING SOAP.**—To obtain a good soap for shaving, says the *Druggists' Circular*, is by no means always easy. The great desideratum is to have a soap that makes readily a rich lather which is slow to dry and that does not require the ceremony of calling for hot water. The most convenient for use are in the shape of paste, so that a little may be taken on the finger and rubbed over the beard, then the brush finishes the process of preparation for the razor. If we take the following ingredients and compound them an excellent soap is produced that leaves nothing further in this respect to be desired: Take white soap, four ounces; spermaceti, one-half ounce; olive oil, one-half ounce. Melt them together and stir until nearly cold. Scent with such oils as may be most agreeable. Another soap may be made by taking white wax, spermaceti and almond oil, of each, one-quarter ounce. Melt and, before cooling, rub in two cakes of Windsor soap, which have previously been reduced to a paste, with a small quantity of rose water. This last, probably, is not unlike a superior shaving soap that has long been in use, and is known as "Rypophag" soap, a first-rate thing with a very wonderful name.

**EFFECTS OF SEA WATER ON LAND.**—Mr. Rein- ders, from one of the German agricultural experimental stations, says: "Land that has been submerged by sea water generally proves sterile for some time, in some cases for 10 to 15 years. This can be traced to the co-operation of the three following chemical causes, in addition to the mechanical injuries produced by the inundation: 1. To the introduction of too great a proportion of chlorine salts. 2. To the hygroscopic property communicated to it, preventing it from drying properly. 3. From the formation of green vitriol or sulphate of iron, which is known to exert a very prejudicial effect upon plant growth. Land which has thus been damaged should be drained as quickly as possible, sown with grass and clover, and allowed to rest. Experience shows that it recovers its fertility sooner if treated in this way than if cultivated all the year round as arable land."

**SELLING JEWELS TO SAVE LIFE.**—Mr. Hynes, of the Bombay mint, has published a letter in which he says that for about three years before the famine the amount, counting silver and ornaments, tendered to the mint, averaged about 6,000 rupees (about £525) monthly. In October, 1876, the tender was about 4,000 rupees' worth, but in November it rose to 70,000 and kept steadily increasing up to September last, when it reached the value of 1,900,000 rupees (about £166,000), or more than 300 times the normal amount. It would appear from this meter that a great strain was felt about March, when the sale of jewels was about double that of the previous month. The pressure accumulated in force till July and the commencement of the southwest monsoon.

**WAXED RICE.**—Waxed rice seems a curious thing, yet, strange to say, it is now in the market. It appears that one or two per cent. of wax adds a peculiar luster to rice, and it makes it look so pretty that the Dutch are profiting much by preparing it for the English to use. Prussian blue is said to be added, and certainly the appearance of some samples bears out this statement.

**A THING WORTH KNOWING.**—The supply of French brandy, says the *British Trade Journal*, not being nearly sufficient for France alone, the residue of the French supply is made up by spirits imported from England and Germany. Under the old commercial treaty with France, the English trader got his raw spirit admitted on more favorable terms than the Germans, and so obtained a monopoly of the trade. A very large and profitable business is done by buying raw spirit at about 2s. per gallon, exporting it to France, doctoring and coloring it there, and then returning it to this country as fine French brandy. This does not seem to be quite a legitimate traffic, but there is a refinement of it that is at once more profitable and more illegal. Among the largest—the largest in fact—shippers of brandy are Messrs. Hennessy, of Cognac, who confine their trade to the higher classes of brandies. Casks with their brand upon them are worth a considerable sum of money. In England and at Hamburg there is a ready sale for such casks, which are at once filled with raw spirit, colored and doctored, costing at the outside 2s. 6d., and then sold as "Hennessy's" best, at about 12s. per gallon. Even blockade running was not supposed to yield such profits!

**WASHING FLANNELS.**—A lady correspondent says: "I will give a little of my experience in washing flannels. I was taught to wash flannel in hot water, but it is a great mistake. In Italy my flannels were a wonder to me; they always came home from the wash so soft and white. I learned that the Italian women washed them in cold water. Many a time I have watched them kneeling in a box, which had one end taken out, to keep them out of the mud, by the bank of a stream, washing in the running water, and drying on the bank or gravel, without boiling; and I never had washing done better, and flannels never held so well. I have tried it since, and find the secret of nice soft flannels to be the washing of them in cold or lukewarm water, and plenty of stretching before hanging out. Many recipes say, don't rub soap on flannels; but you can rub soap on to the advantage of the flannels, if you will rinse it out afterward and use no hot water about them, not forgetting to stretch the threads in both directions before drying. Flannels so cared for will never become stiff, shrunken or yellow."

**GLUE FOR POLISHED STEEL.**—The Turks glue diamonds and other jewels to their metal settings with a mixture made as follows: Dissolve five or six hits of gum mastic, each the size of a large pea, in as much spirits of wine as will suffice to render it liquid. In another vessel dissolve in brandy as much isinglass, previously softened in water, as will make a two-ounce phial of strong glue, adding two small bits of gum ammoniac, which must be rubbed until dissolved. Then mix the whole with heat. Keep in a phial closely stoppered. When it is to be used set the phial in boiling water. This cement perfectly resists moisture, and it is said to be able to unite effectively two surfaces of polished steel.

**RABBITS AND FRUIT TREES.**—A correspondent of the *Western Ruralist* says: I have used various remedies to prevent rabbits gnawing fruit trees, and the best is the following: Take soft soap and sulphur—not particular as to proportions, so there is enough soap to incorporate the sulphur, so that every part of the mass will readily adhere to the trees. This does not so readily wash off as soap alone, and the sulphur is probably more repulsive than any other cheap and convenient article.

**A SAPONACEOUS INSECTICIDE.**—A soap, insoluble in water, may be made by mixing castile soap with a solution of sulphate of alumina, sulphate of iron, or sulphate of copper; copper making the mixture green, iron leather-colored, alumina colorless. It may be applied by melting, or by solution in petroleum or other volatile hydrocarbons. If the solution is not perfectly fluid, it should be warmed.

**BLEUING IRON AND STEEL BY BOILING.**—If iron or steel articles be boiled in the following mixture they will take a fine blue tint: Dissolve four ounces hyposulphite of soda in one and one-half pints of water, and then add a solution of one ounce acetate of lead in one ounce of water.

## GOOD HEALTH.

### The Abuse of Athletics.

We notice that English journals are wisely condemning the modern idea of athletic exercises, which consist of walking matches in public halls, etc. Such feats of pedestrianism and other similar extravaganzas in athletics are unnatural, and cannot fail to be more or less injurious, especially to those who have not been prepared for them by a long course of "training." Certain "professional" pedestrians and gymnasts may perhaps attempt these performances with comparative impunity; or if not, the world can well pardon the fools for shortening their useless or worse than useless career. Indeed, the sooner they kill themselves the better; for their example is pernicious in the extreme. Other people, who, but for the cheap notoriety gained by these muscular idiots, and the silly ambition to win similar "laurels" for themselves, would never think of attempting such preposterous feats, are carried away with the mania, and suffer irreparable injury to health.

We have been sorry, says the *Journal of Chemistry*, to see the newspaper eulogies of Miss Bertha von Hillern's pedestrian achievements. She is held up as an example of what women may do if they will, and is encouraged to go on to more extraordinary exploits in the same line. Now there can be no question that American women do not walk enough. In that respect, they are far behind their English sisters, who think nothing of a walk of five or ten miles, and who may often be seen doing their 15 or 20 miles a day in the Scotch highlands or in Switzerland. There is no better exercise than snell "tramps" in the open air; they are wholesome alike for the body and for the mind, and it is a pity that Yankee girls do not readily take to them. But a treadmill round of so many miles in so many hours, in a public hall, with a crowd of idle gazers betting on the result as on a horse-race, is a very different thing; and we doubt whether it will stimulate more sensible women to more rational efforts of pedestrianism. It is likely rather to awaken a disgust for all exercises of the kind.

**CLEANLINESS.**—Dr. N. H. Paaren writes as follows in the *Western Stock Journal*: It is true in all cases known to us, that the finer instincts agree with the conclusions of laborious scientific research. The great laws of nature do not jar, but show a constant harmony; and it is pleasant to see the elucidation of these truths, which may sound too grand to be mentioned in connection with the operation of cleaning a stable. We cannot, however, refrain from admiring this harmony, when we see the busy housewife and clean, industrious maid scrubbing at floors and furniture, apparently perfectly clean, and washing and scalding dishes which we would at first sight think might be purified much more simply. Their instincts are true. You come into the room after the furniture has been scrubbed, and you breathe a fresher air, and are in fact a healthier, and therefore a happier and better being. You eat of these dishes—the food tastes better and it digests better; you therefore become, from this cause also, healthier and happier. The reason of this is, that the furniture receives upon its surface the organic matter arising from all living creatures, which after a time is apt to become unpleasant and unwholesome. Every chair, then, and every table, becomes a source of disease; every piece of the wall and the ceiling are the same. This is especially the case with the furniture most in use; every touch of the hand—even the whitest hand—is a source of impurity, and that which is used most has most need of being cleaned. Many porous bodies—and amongst these, cloth—take up these odors in great abundance, and sometimes retain them so much as not to give out any perceptible quantity until they are very much filled. We find this to be the case with carpets, which do not till after sometime become offensive and stifling, but when they are so, are very difficult to clean. The process of cleaning is too often confined to beating. It is to be hoped that washing of carpets will become more general. Until this is the case, we shall never get quite free from the unwholesome mists of some of our floors.

**FLATULENT DYSPEPSIA.**—At a recent meeting of the Paris Academy of Medicine, M. Leven read a paper on the gases of the stomach and flatulent dyspepsia. He is of opinion, says the *Journal of Chemistry*, that food does not produce gas, and that the gases which are found in the digestive tube proceed from the external air, the blood and fecal matter. These gases are continually put in motion by the pathological contractions of the muscular fibers of the intestines. Expelled by the mouth they are constantly renewed, and their production may be as incessant in a starving man as in one who is well fed. This symptom of production of gas, therefore, signifies an irritation of the stomach, which is always consecutive to a long-standing gastric dyspepsia. The progress of the disease and the treatment to be adopted for its cure confirm these data of clinical observation. There is no need to seek for any therapeutic agent to combat these gases.

**TO MAKE COW'S MILK MORE DIGESTIBLE.**—In a German paper we note a hint given by Dr. Schaaf with reference to the taking of cow's milk by persons who have a weak stomach. He says he has always succeeded in avoiding any evil effects by eating a little salt on bread either before or after taking the milk. When he omits to do this, a single glass of milk will produce diarrhoea, whereas with salt he can take a whole liter.

**POISONING BY EARRINGS.**—Two young girls in Paris suffered from blepharitis, and one of them also from an inflammation of the lower part of the left auricle. All the usual remedies proved inefficacious, but both patients quickly recovered after their copper earrings were discarded.

**CHARCOAL FOR OFFENSIVE BREATH.**—A correspondent of the *Dental Cosmos* says that the best treatment in regard to offensive breath is the use of pulverized charcoal, two or three tablespoonfuls per week, taken in a glass of water before retiring for the night.

**CONCLUSIVE.**—Lodger: "I detect rather a disagreeable smell in the house, Mrs. Jones. Are you sure the drains—" Welsh Landlady: "Oh, it can't be the drains, sir, whatever. There are none, sir!" —*Punch*.



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THE ORIGINAL ARTICLES in this paper are mostly set in solid type, giving in our columns one-third more reading than is contained in ordinary leaded matter.

Our latest forms go to press on Thursday evening.

SAN FRANCISCO:

Saturday Morning, Dec. 22, 1877.

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## NEW ADVERTISEMENTS.

Situation Wanted as Smelter and Refiner, P. E. M., this office.

## The Week.

This week has been devoted to preparation for the holidays by those in a position to make such preparation. The stores are in full holiday attire and the streets are crowded with eager purchasers. The principal events occurring, which interest all Californians, were the advent of rain and the election of our United States Senator. Both are full of promise for the future; the one that it will bring us good crops and good times and the other that he will do everything the people want him to. What more welcome Christmas gift could have been made to the people of this State than the refreshing rains which the week has brought? Men prone to doubt and misgivings were beginning to give voice to the darkest apprehensions, and had not the gentle falling rains dissolved their hard anticipations, there would have been most dismal Christmas times in many homes. But the rains have come, and so far as present appearances go, they have washed clean the spotted theory which measures the downfall by a tarnished sun. Hearts are now as buoyant as a week ago they were despondent. All along the line of the coast counties and the adjacent valleys, over the great fertile region above the bay and the central region of the Sacramento and lower San Joaquin valleys, there has come a refreshing, a glorious rain.

A SAN DIEGO dispatch, December 15th, states that the placer mines near San Rafael, Lower California, cover a region of two miles by seventeen miles in size, and prospects in places are as high as 50 cents per pan and better. That may be so, but the places are few and far between, and there is hardly water enough in the country to wash clothes, much less placer dirt. There have not been many men who made fortunes in the San Rafael placers.

JAMES BALLANTYNE, of Edinburgh, the well-known author, is dead.

## The Mechanics' Institute.

An important and fully attended quarterly meeting of the Mechanics' Institute was held on Saturday evening last in the "Patent room" in the Institute building. President Hallidie was in the chair and read his report, which embraces a period of six months, the quarterly meeting of September having been omitted. We make the following extracts from the report: On account of the pressure for room by our largely increasing membership, and especially the demand for increase of reading facilities, the Trustees have been compelled to enlarge the area of the reading-room. The Trustees, for the past three years, have been from time to time seriously considering the matter of a new building, but so far have not been able to see the way clear for its purchase. The regular funds and income of the Institute are absorbed as fast as obtained, and the demand for new books is always ahead of the ability to provide; and unanticipated but necessary expenses keep the society more or less in debt. Our membership, while good and increasing, is far behind what it should be for a city with so large a population, and far behind what it should be, if the Mechanics' Institute was able to fulfill its mission, even in part, by a more direct interest in the educational and social status of its members, which it could have if provided with a building where it could furnish class rooms and halls for social reunions.

This society, with its 2,500 members, of working men and working women, children of toil, and the hands of each one of them are harder than his heart, have lived long enough in this bright California of ours, and have had hard years enough of bitter experience to wish well of his fellow-man, and to do to him as he would be done by, and, while standing up for his rights, does not forget the rights of others. The events of the past few months in this city cannot otherwise than cause a thinking man to reflect, and reflect deeply, on the influence of circumstances on the minds of men and the disposition of designing men to distort those circumstances to suit their own ends. The Mechanics' Institute is not indifferent to surrounding conditions, and while it recognizes the fact that many wrongs need righting, it cannot see that any retaliatory wrongs will make a right, and it utterly condemns the spirit of violence and incendiarism breathed by the false-hearted leaders, who are enemies of the mechanic and working man.

The receipts and expenditures for the past six months had been as follows: General fund—receipts, \$10,529.70; disbursements, \$11,955.52, leaving due to the Treasurer at this date, \$1,435.88. The sinking fund showed receipts amounting to \$2,212.82, and there was a balance in the treasury of \$2,122.82. The amount remaining unpaid and collectable was \$1,769.69, and there was outstanding bills to the amount of about \$4,000, principally due for books bought in London. The receipts of the last exhibition amounted to \$313,970.30; disbursements, \$314,113.71, leaving \$143.41 due the Treasurer. The steam engine exhibited by Hinkley & Co. at the eleventh fair had been bought by the Managers for \$4,000, and paid for from the proceeds of the last exhibition. Having completed their task the different gentlemen connected with the present building had assigned the property to the Institute for its benefit. The names were: A. S. Hallidie, P. B. Cornwall, Henry L. Davis, Asa R. Wells, J. Duffy, Ernest L. Ransome, James Drury, H. L. Smith, A. E. Fish, George Spaulding, James Spires, C. Waterhouse, J. B. Stetson, H. L. Hutchinson, James C. Patrick, Charles Elliott, H. W. Jones, Richard Savage, J. H. McDonald, John P. Curtis, A. S. Iredale, Samuel H. Wheeler. The building cost \$77,379.03; the gas, water and steam pipes and fittings, \$15,050.75; the steam engine, boilers, shafting, etc., \$16,106.61; the furniture, \$6,109.67. Total, \$114,646.25. As yet the Trustees had not determined whether an industrial exhibition should be held next year or not, but it was probable the exhibition would take place. As the lease would terminate shortly, the late Board of Exhibition Managers had been looking around for a suitable location, so that in the event of its being necessary, they could reconstruct it on other ground. In answer to A. D. McDonald, Mr. Hallidie said that the lease would expire on January 1st, 1880.

The President's report was received and adopted. The exhibition building is fully equipped, is in first-class order, and perfectly adapted to the purposes for which it was designed. A clause in the Constitution of the Institute prevents the Trustees from incurring any debt for purposes of exhibitions, and for this reason the Trustees have individually taken the burden on themselves, as the Board of Managers, and carried on the exhibitions. While, therefore, the responsibilities were taken on their own shoulders in case of deficiencies, all the profits were to be turned over to the Institute. The building now being entirely paid for, and free from any debt whatever, has been turned over to the Institute by the Board of Managers. One of the members took occasion to remark on the fact that it was a somewhat unusual thing now-a-days to see so great a trust given up with all the debts paid, and no whisper even of any misappropriation of a cent of the funds. A hearty vote of thanks was given to the Presi-

dent and Board of Managers for their valuable services and honorable actions.

Mr. Gallagher introduced an amendment to the by-laws to the effect that the library be kept open on Sundays. After some debate, this was referred to the Trustees.

A petition to both houses of the Legislature was presented, requesting, on grounds of public benefit, that an appropriation be made for the next two fairs of \$10,000 each year. Several members objected to this action, and the matter was referred to the Trustees.

There was considerable discussion over a proposed amendment to the Constitution, previously offered by Mr. Wheeler, which permitted a Trustee to be chosen without having to both live and have his business in this city. Under the present rule no resident of San Rafael, San Mateo or Oakland was eligible for Trustee. After a great deal of talk, the members thought they would rather have Trustees who lived in the city and county of San Francisco, as they would be more prompt in attendance at meetings.

Notice was given by Mr. Gallagher of several proposed amendments to the Constitution, which were laid over, under the rules.

## Christmas.

Again, on the current of the days, are we borne to the holiday moorings. It is an anchorage off a pleasant shore, hither we may go from our wearisome labors upon the deck of everyday affairs, and forget our cares amid the joyful Christmas pleasures and plenty. Here we may don our bright apparel and give the body, mind and soul full field to feast on Christmas bounty, to be glad in the double joy of Christmas offerings to loved ones, and to borrow new consolation and zeal from heartfelt Christmas devotion.

It is, indeed, well that the year is broken up for us, and that its heavy fragments are gilded on their edges by happy recreation days. We have gone by night through forests dense and dark, and yet the way has lost much of its terrors because we knew that here and there we should find a clearing and the glowing cabin fires would drive away the dread which the lonely travel pressed upon the mind. Upon many of us life's burdens rest quite heavily. The routine of toil has, perhaps, little to inspire of joy for its own sake. Our waking hours may be charged with cumbering cares, and our slumbers be too often broken by minds fighting mimic battles of life through the silent hours. To lives thus burdened, the gladness of holidays, with their merry makings and reunions, should come as angels giving rest and joyful diversions. Then the glad greeting of friends and relatives should bring convincing proof that affection does not grow old. Then the loving words of a wife should teach the heart that its deepest emotions can still gild the life with light and joy. Then the merry cries of happy children, sweet as the notes of song-birds in leafy groves, should fill the mind with thoughts of life's most precious treasures. And then, with the glory of an unselfish emotion, let thanks arise to the Giver of all these loves to live and labor for, and the inmost soul will grow with gladness at the assurance that "no man liveth to himself, neither dieth to himself."

We have read somewhere that the rejoicings which now mark the advent of Christmas time were introduced by the early church for the purpose of winning the people away from allegiance to the pagan rites and superstition, which were naturally enough carried over from the days of heathenism to the worship of the new-found Savior. The early converts were honest in their following of the Man of Nazareth, but their customs were strong upon them and they carried into His service the manifestations of devotions which they deemed acceptable to old Jupiter and his court of gods and goddesses. Hence arose the "manger songs" and "Christmas carols," the shining Christmas tree, the gift giving, and all the observances of the Christmas festival.

Whether this be the true origin of the custom which we now observe or not, it matters little, but certain it is that we may well use the day and its delights according to its reported early designs, although we are far removed from the days of paganism, we have tendencies and beliefs which it is just as essential to overcome to attain the nobility of thought and elevation of purpose which are among the possibilities of our lives.

We have alluded to the need of freeing the mind at times from the engrossing cares which the struggle for existence engenders. The modern sacrifice of the nobler virtues and aspirations in the rush for pecuniary advancement is the frequent theme for comment, and fitly so. It is a form of materialism more dangerous than that of the philosophers, because it comes upon us in the ordinary discharge of our avocations and gains control by most insidious steps. It steals upon us ere we are aware, and using such heavenly livery as is contained in the ideas of frugality, industry, devotion to purpose and the like, it gives us over at length to the demon of greed, of cruel selfishness and of debasing vain glory.

As an agency most potent to thwart the evil influence which thus saps our manhood, the thoughts most fitting to the Christmas time

come to us. "He who went about doing good" in the lanes and by-ways of Judea stands before the world, both in religious and secular literature, as the noblest example of self-sacrifice and of disinterested labor and suffering for others, which the mind of man can conceive of. No heart, into which can steal the faintest appreciation of his character, and which can arouse itself to the extent of the slightest emotion on the subject, can fail to perceive that the too prevalent self-serving of the day is false to even the human idea of the truth and nobility of manhood.

Starting with this as the central idea in the glad Christmas customs and observances, it is easy to perceive that its spirit gives life and significance to them all. From the "Merry Christmas" wishes of the early dawn, when the pattering of eager feet wakes us to hear the prayers of our children for our joy, up to the hospitable spread of bounty on our board, and the glad anthem of praise which fills cathedral's domes, the lesson which the day imparts is that of the joy of making others happy and in their joy to find our own. It is a noble thought. It is even nobler and higher than humanity. It is divine.

Thus would we preach our little Christmas sermon to our friends. Thus would we forget for the moment the topics which most engage our pen, and urge our readers to join with us in the thoughts which make us better for the thinking. As we remember the many thousand homes into which our Christmas greeting will come we are thankful for the opportunity to assure them all that the thoughts which we have commended are such as we feel for them. Sometimes the nearness which we feel to our kind readers amounts almost to the consciousness of a personal presence, and such it is today. As we greet you one and all, dear friends, let us urge upon you the deep significance of the Christmas greeting, and then, with earnest heart, we will wish you all a MERRY CHRISTMAS.

## Academy of Sciences.

The regular semi-monthly meeting of the California Academy of Sciences was held on Monday evening, Prof. Davidson in the chair. Mr. J. R. Seupham gave the results of a series of meteorological observations made in the State, and referred to the apparent failure of the theory of 11-year periods of sun-spots, in relation to rainfall. Discussion among the members on this subject showed the general opinion to be adverse to the theory that the sun-spots have any known influence on rain supply.

Dr. H. Behr, read a paper on the "Resistance of the Eucalyptus to Ignition," which carried further the remarks made at previous meetings on the subject, and which we have already listed.

Prof. Davidson read an able and interesting paper "On the Necessity of a Physical Survey of the State of California." We shall publish this essay shortly, having secured the Professor's permission to do so.

It was stated that nothing had yet been done toward selecting material to be sent to the Paris exposition, but a meeting would be held to determine the matter.

The Nominating Committee to nominate a regular ticket, appointed under the rules by the Trustees and Council, submitted a report, re-nominating all the present officers of the Academy. This was done, as it was deemed injudicious to have any changes made while important business matters were pending with which those in office were familiar.

THE PRESS.—We present our readers this week with a paper replete with original matter of general interest. Prominent among the articles referred to are those "On Mars and His Moons," by Prof. LeConte, President of the University of California; a comprehensive review of the mines of El Dorado county; "Trees and Rainfall" by Mr. Purnell; a very valuable concluding chapter on "Hydraulic Mining in California," by Mr. Bowie, with tables of great interest to the engineering fraternity; a summary of the work accomplished by the Hayden Geological Survey in 1877; a timely article on Christmas, and one giving some points on necessary mining legislation; reports on the meetings of the Academy of Sciences and the Mechanics' Institute, as well as those of the Gould & Curry and Lady Bryan and Ophir mining companies. These, with the usual variety in the different departments, make up a number which prove the value of the PRESS more than anything we could say, and we hope our readers appreciate our efforts to carry on a first-class industrial journal.

WHAT IS IT?—"A mineral has been found in Kern county, California, which is puzzling the geologists, no one knowing what to call it. It is opaque; in color, tin white; lustre, metallic; laminated, soft, yields to the finger nail; leaves a streak the color of amalgam on the back of looking glasses; it is unchanged by a heat which reduces a Hungarian crucible; it is perfectly insoluble in nitric or muriatic acids, or any of their combinations, and has a specific gravity about equal to that of mispickel." [The above item is from an Eastern paper. If any of our readers know of this mineral we would like very much to see a specimen.—EDS. PRESS.]



[illegible]



TABLE NO. IV.

The Johnson Claim. Tabular Statement Showing Amount of Water used and Cubic Yards of Gravel Moved; Cost and Receipts of Hydraulic Washing from March 1, 1875, to December 16, 1875.

Year.	Run Commenced.	Months.	End of Run.	Washings Days.	Hours.	Amt of Water used in 24 hr. M. I.	Grade of Sluices.	Cubic Yards Gravel Washed	AVERAGE YIELD.		AVERAGE COST.		TOTAL COST.			RELATIVE COST PER CUBIC YARD.					BULLION YIELD.								
									Per Tons Water.	Per Cubic Yard.	Water per Yard Gravel Moved.	Material, Etc., Per Cubic Yard.	Melting and Refining.	Blocks & Lumber.	Water.	Material.	Blocks & Lumber.	Water.	Melting and Refining.	Total Cost.	Pounds Avoirdupois.	Fineness.	Value of Gold.	Value of Silver.	Total Amount of Bullion Produced.				
1875	1 March	22	April 21	22	13	18,040	30 feet.	196,632	1.76	\$0.11	\$0.08	\$0.0063	\$0.0236	\$18.20	\$1,715.25	\$202.06	\$1,935.50	\$0.020	\$0.0020	\$0.0076	\$0.0004	\$0.037	90.81	32.20	\$9,117.17	\$31.10	\$9,148.27		
	22 April	21	May 20	21	13	18,040	30 in. to 16 ft.	196,632	1.76	\$0.07	\$0.04	0.0063	0.0236	7.08	558.24	243.82	809.14	0.020	0.0020	0.0076	0.0004	0.037	90.81	32.20	\$9,117.17	\$31.10	\$9,148.27		
	3 June	2	July 1	2	13	21,770	30 in. to 16 ft.	196,632	1.76	0.07	0.04	0.0063	0.0236	10.33	687.89	247.97	976.13	0.020	0.0020	0.0076	0.0004	0.037	90.81	32.20	\$9,117.17	\$31.10	\$9,148.27		
	17 July	10	Aug. 16	10	13	26,604	30 in. to 16 ft.	196,632	1.76	0.06	0.04	0.0063	0.0236	10.20	250.87	103.04	2,096.00	0.020	0.0020	0.0076	0.0004	0.037	90.81	32.20	\$9,117.17	\$31.10	\$9,148.27		
	10 Sept.	9	Oct. 8	9	11	9,200	30 in. to 16 ft.	196,632	1.76	0.06	0.04	0.0063	0.0236	9.05	356.50	179.91	738.60	0.020	0.0020	0.0076	0.0004	0.037	90.81	32.20	\$9,117.17	\$31.10	\$9,148.27		
	10 Oct.	9	Nov. 8	9	11	16,004	30 in. to 16 ft.	196,632	1.76	0.09	0.04	0.0063	0.0236	9.05	356.50	179.91	364.11	0.020	0.0020	0.0076	0.0004	0.037	90.81	32.20	\$9,117.17	\$31.10	\$9,148.27		
	10 Nov.	16	Dec. 2	16	20	16,004	30 in. to 16 ft.	196,632	1.76	0.09	0.04	0.0063	0.0236	9.05	356.50	179.91	540.36	0.020	0.0020	0.0076	0.0004	0.037	90.81	32.20	\$9,117.17	\$31.10	\$9,148.27		
	10 Dec.	130	2	111,278				196,632	1.76	\$0.08	\$0.04	\$0.0063	\$0.0236	\$80.51	\$4,043.08	\$583.03	\$1246.31	\$1514.00	\$7,465.99	\$0.020	\$0.0020	\$0.0076	\$0.0004	\$0.037	90.81	32.20	\$9,117.17	\$31.10	\$9,148.27

TABLE NO. V.

The Sicard Claim. Tabular Statement Showing Amount of Water used and Cubic Yards of Gravel Moved; Cost and Receipts of Hydraulic Washing from May 28, 1874, to January 21, 1875.

Year.	Run Commenced.	Months.	End of Run.	Washings Days.	Hours.	Amt of Water used in 24 hour M. I.	Height of Banks.	Grade of Sluices.	Cubic Yards Gravel Wash'd	AVERAGE YIELD.		AVERAGE COST.		TOTAL COST.				RELATIVE COST PER CUBIC YARD.					BULLION YIELD.				
										Per Cubic Yard.	Per Tonn Water.	Water per Tonn Gravel moved.	Material, Etc., Per Cubic Yard.	Melting and Refining.	Blocks & Lumber.	Water.	Material.	Blocks & Lumber.	Water.	Melting and Refining.	Total Cost.	Pounds Avoirdupois.	Fineness.	Value of Gold.	Value of Silver.	Total Amount of Bullion Produced.	
1874	28 May.	13	July.	8	17 18	17,208	30 feet.	34 in. to 16 ft.	51,667	3.00	.41	.13	.039	22.23	429.12	192.73	1,262.08	.020	.0061	.0038	.0007	.033	32.00	11.75	\$3,320.74	\$9.00	\$3,329.74
	14 July.	13	Aug.	12	16 16	17,208	30 feet.	34 in. to 16 ft.	51,667	3.00	.41	.13	.039	22.23	429.12	192.73	1,262.08	.020	.0061	.0038	.0007	.033	32.00	11.75	\$3,320.74	\$9.00	\$3,329.74
	13 Aug.	14	Sept.	24	15 17	7,854	30 feet.	34 in. to 16 ft.	11,515	1.40	.43	.29	.039	31.30	658.78	87.07	1,553.47	.057	.0061	.0038	.0007	.033	32.00	12.27	\$3,413.20	15.51	\$3,428.71
	5 Oct.	20	Oct.	18	19 22	9,958	30 feet.	34 in. to 16 ft.	28,640	2.57	.41	.14	.039	31.30	658.78	87.07	1,553.47	.057	.0061	.0038	.0007	.033	32.00	12.27	\$3,413.20	15.51	\$3,428.71
	20 Nov.	18	Dec.	18	19 23	9,958	30 feet.	34 in. to 16 ft.	28,640	2.57	.41	.14	.039	31.30	658.78	87.07	1,553.47	.057	.0061	.0038	.0007	.033	32.00	12.27	\$3,413.20	15.51	\$3,428.71
	18 Dec.	21	Jan.	21	10 11	18,708	30 feet.	34 in. to 16 ft.	63,525	8.39	.29	.08	.039	44.04	1,265.74	209.53	1,519.31	.039	.0061	.0038	.0007	.033	32.00	19.57	\$4,465.60	14.55	\$4,480.15
1875					107 11	53,728			155,347	2.89	\$0.37	\$0.13	\$0.0039	109.70	\$3,940.48	\$601.75	\$6,205.40	\$0.025	\$0.0061	\$0.0038	\$0.0007	\$0.039	196.75	71.94	\$16,837.94	\$53.02	\$20,197.07

A resume of the entire work done by this company from June 1, 1874, to September 30, 1876, showing gross receipts and total disbursements, including the rebuilding of the dam at the head of the ditch, the construction of roads, ditches, etc., but excluding the purchase of some mining ground, gives the following result:

1,533,728 inches (2,159 cubic feet each) washed  
2,276,967 cubic yards of gravel, which yielded  
\$231,893 = 12,026.34 troy oz.

Disbursements.  
Water.....\$17,307.62  
Labor.....\$2,345.70  
Materials.....\$21,738.35  
Total.....\$41,391.67  
Average value of the oz. metal, gold and silver.....\$19.29  
Total cost per oz. metal produced.....\$11.38

Segregated as follows:  
Water, per ounce.....\$1.43  
Labor.....0.85  
Material.....1.81  
Total.....\$4.09  
Total cost of hydraulic washing per cubic yard is.....\$0.06

Segregated as follows:  
Water.....\$0.008  
Labor.....0.030  
Material.....0.010  
Total.....\$0.060  
Average yield per cubic yard.....\$0.1019  
Average amount of gravel washed per inch water, cubic yards.....1.48

The following tabular statement shows the workings of a mine on 4 1/2 grades, high banks, and with a hydrostatic pressure ranging from 200 to 385 feet. The advantages of heavy grades and pressure, over the minimum La Grange grades, are clearly shown by the quantity of material moved, and a comparison of the work and costs will be of interest to those engaged in hydraulic mining. (See tables VI., and VII.)

DETAILS.		1874-5	1875-6
Length of run, days.....		295	342
Washings commenced.....	Jan. 1	Nov. 18	Nov. 18
Washings ended.....	Oct. 14	Oct. 15	Oct. 15
Amt of water used, mining in.....		336,972	700,000
Grade of sluices.....		64 in. to 12 feet	64 in. to 12 feet
Depth of banks.....		180 feet	260 feet
Cubic yards gravel washed.....		1,855,000	2,910,700
Gross yield.....		\$74,271.77	\$102,735.73
Total cost.....		\$53,083.33	\$94,823.75
Cubic yards gravel washed per in. of water.....		4.50	4.17
Relative yield per in. water.....		10.1	27.5
Relative yield per cubic yard.....		3.0	6.6
Relative cost water per cubic yd.....		.0077	.0074
Relative cost, labor, etc., per cubic yard.....		.0207	.0245

\* For details see reports of the North Bloomfield gravel mining company.  
† Less cost of milling and refining.  
‡ Exclusive of cost of milling and refining.

Table VII.—Statement of Disbursements and Relative Costs per Cubic Yard.		1874-5	1875-6	1874-5	1875-6
Labor account.....		\$22,790.39	\$40,975.85	\$0.0129	\$0.0140
Blocks and lumber.....		3,007.20	5,212.62	0.0015	0.0018
Explosives.....		2,944.94	10,279.78	0.0032	0.0035
Material account.....		5,063.89	9,240.06	0.0030	0.0036
Gen'l expense act.....		4,201.95	7,304.12	0.0022	0.0025
Water.....		14,430.49	21,740.97	0.0077	0.0074
		\$53,083.33	\$94,823.75	\$0.0903	\$0.0923

1875-6—Gold bullion, ounces.....10,401.28  
Value per ounce, gold and silver.....\$15.38  
Total cost per ounce.....\$0.98

§ Material account excludes \$3,807.71 on hand.

Segregated as follows:

Labor.....\$3.93  
Blocks and lumber.....0.50  
Explosives.....0.98  
Material.....0.88  
General expense.....0.70  
Water.....2.00  
Total.....\$9.03

Conclusion.

The question of the yield and costs of working hydraulic claims is one of great interest to the engineer. In estimating the production of gravel mines, the calculation of a given number of cents per cubic yard refers to the entire quantity of gravel moved or to be moved, since it is impracticable to wash out the gold-bearing strata without moving the entire superincumbent mass. The yield is, therefore, apportioned to the total quantity of ground washed.

Having prospected a claim, and ascertained the approximate value of the gravel per cubic yard, grade and quantity of available water being known, its yield can be estimated for a reasonable period.

In discussing the question of working unexplored localities, and even those already developed, it is to be observed that there are no known means which enable one to predetermine accurate economical results.

Therefore, in estimating the yield of gravel properties, even under the best of circumstances, the most careful opinion drawn from immediate facts is owing to the nature of deposits necessarily qualified.

Errata.

Page 297, first column, Milton mining and water company table. The heading, "Amalgam Yield in Avoirdupois," should extend over *Cut, Tunnel and Undercurrent.*

Page 329, second column, second paragraph under heading, *Damst* after word *foundation*, note should read as follows: This season (1877) on the lower side of each of the crib dams a stone embankment has been filled in and faced with heavy walls of dry rubble stone of large size. The old crib structures have been thoroughly overhauled and the skin of planking which is spiked to the water-face forming the water-tight lining has partially been renewed, and next year all the present unfinished work will be completed. The strengthening of these cribs will permit the reservoir to be filled to its fullest capacity.

Page 361, under heading, *Derricks*,\* omitted after word *sills*, on seventh line, foot note should read: "Generally an iron ring is sunk on the lower end of the mast from the middle of which end a short iron pin is arranged to project. When the mast is in position this pin fits in a hole bored in a heavy sill timber, which permits the derrick to be revolved as desired."

Page 361, first column, second paragraph, second line, stamped should read *tamped*.

RAPID ERECTION OF A BRIDGE.—The *Cleveland Herald* of November 24th says: "Mr. George Reed, Superintendent of Bridges on the Lake Shore road, has just completed the construction of an iron bridge at Elmore, in Ottawa county. The work of putting up the bridge, which is composed of two iron spans, each 108 feet, each weighing 60 tons, was completed in just seven days after the iron was delivered. While the work was being done the old bridge had to be kept in position, as trains were passing at all hours. The last connection for the new bridge was made Wednesday evening and trains allowed to run on it. The trestle work will be taken down at once."

### Geological Work of the Hayden Survey During the Summer of 1877.

The necessity of a careful examination of the various geological formations in the field, and a review, by a practical paleontologist, of the various districts that have from year to year been surveyed by the different geologists of this and other surveys, has been long felt. Such a work, indeed, was imperatively necessary, before a consistent and comprehensive classification of the formations could be established. This duty was assigned to Dr. C. A. White, the paleontologist of this survey; and he took the field at the beginning of the past season and continued his labors until its close. The special duty with which he was charged was to pursue such lines of travel as would enable him to make critical examination of the geological formations in succession as they are exposed to view on both sides of the Rocky mountain chain and also on both sides of the Uinta chain; to collect and study the fossils of these formations in such detail as to settle, as far as possible, the questions of the natural and proper vertical limits of the formations, their geographical range, their correlation with each other, and to define the paleontological characteristics of each.

He has pursued his researches with such success during the past season, as to demonstrate the necessity of continuing this class of investigations by various lines of travel, across what is generally known as the great Rocky mountain region; especially those portions of it that have been surveyed, as well as those in which surveys are in progress.

Among other important results, he has shown the identity of the lignitic series of strata east of the Rocky mountains in Colorado, with the Fort Union group of the Upper Missouri river; and also its identity with the great Laramie group of the Green river basin and other portions of the region west of the Rocky mountains. He also finds the planes of demarkation between any of the mesozoic and cenozoic groups, from the Dakota to the Bridger inclusive, to be either very obscure or indefinable; showing that, whatever catastrophic or secular changes took place elsewhere during all that time, sedimentation was probably continuous in what is now that part of the continent, from the earliest to the latest of the epochs just named. Other results and further details of the season's work will appear in the following paragraphs.

The general course of travel pursued by Dr. White during the season was as follows, not including the numerous detours, meanderings and side trips, which the work necessitated: Outfitting at Cheyenne he journeyed southward, traversing in various directions a portion of the great plains which lie immediately adjacent to the eastern base of the Rocky mountains in Colorado. The most easterly point thus reached was some 60 miles east of the base of the mountains, and the most southerly point about 25 miles south of Denver. Returning to Denver to renew his outfit, he crossed the Rocky mountains by way of Boulder pass through Middle Park. After making certain comparative examinations of the mesozoic and cenozoic formations in Middle Park, he proceeded westward to the headwaters of the Yampa river, following that

stream down to the western foothills of the Park range of mountains. Here resuming his comparative examinations of the mesozoic and cenozoic strata, he passed down to the valley of the Yampa as far as Yampa mountain, one of those peculiar and remarkable upthrusts of paleozoic rocks through mesozoic strata. In all this area, as well as that between the Yampa and White rivers, the Laramie group reaches a very great and characteristic development; and it received careful investigation, yielding some of the most important results of the season's work. Crossing the ground between the two rivers named, to White River Indian Agency; thence down White river valley about 100 miles; thence to Green river, crossing it at the southern base of the Uinta mountains, making many detours on the way, he reviewed the geology of the region which he had surveyed during the previous season. This review brought out not only the important paleontological facts before referred to, but it also added materially to the elucidation of the geological structure of the region which lies between the eastern end of the Uinta mountain range on the west and the Park range on the east.

Beyond Green river he pursued his travels westward, studying the mesozoic and cenozoic strata that flank the Uinta range upon its south side, and making comparisons of both their lithological and paleontological characteristics.

In this way he traversed the whole length of the Uinta range; crossing at its junction with the Wasatch range over into the valley of Great Salt Lake. Recrossing the Wasatch, to the north side of the Uinta range, he continued his examination of the cretaceous and tertiary strata into and entirely across the great Green river basin, leaving the field at the close of the season at Rawlin's station on the Union Pacific railroad.

A general statement of the results of the season's work have been given in a previous paragraph, but the following additional summary will make the statement somewhat clearer, being made after the route of the season's travel has been indicated. The formation of later mesozoic and earlier cenozoic ages, especially those to which Dr. White, in former publications, has applied the provisional designation of "post-cretaceous" have received particular attention. The extensive explorations of Dr. Hayden in former years, and the paleontological investigations of the late Mr. Meek, pointed strongly to the equivalency of the Fort Union beds of the upper Missouri river, with the lignitic formation as it exists along the base of the Rocky mountains in Colorado; and also to the equivalency of the latter with the Bitter creek series, west of the Rocky mountains. The investigations of this year have fully confirmed these views by the discovery not merely of one or two doubtful species common to the strata of each of these regions, but by an identical molluscan fauna ranging through the whole series in each of the regions named.

This shows that the strata just referred to, all belong to one well marked period of geological time, to the strata of which Mr. King has applied the name of "Laramie group" (Point of Rocks group, of Powell). His investigations also show that the strata which, in former reports by himself and Prof. Powell, have been referred to the base of the Wasatch group, also belong to the Laramie group, and not to the Wasatch. He has reached this later conclusion not merely because there is a similarity of type in the fossils obtained from the various strata of the Laramie group with those that were be-



fore in question, but by the specific identity of many fossils that range from the base of the Laramie group up into and through the strata that were formerly referred to the base of the Wasatch. Furthermore, some of these species are found in the Laramie strata on both sides of the Rocky mountains. Thus the vertical range of some of these species is no less than 3,000 feet, and their present known geographical range more than 1,000 miles.

Besides the recognition of the unity of the widely distributed members of the formation of this great geological period; bounded by those of undoubted cretaceous age below and those of equally undoubted tertiary age above; his further observations have left comparatively little doubt that the "Lake Beds" of Dr. Hayden as seen in Middle park, the "Brown's park group" of Prof. Powell and the "Uinta group" of Mr. King all belong to one and the same epoch, later than, and distinctly separate from the Bridger group. In that portion of the region which lies adjacent to the southern base of the Uinta mountain range, and which is traversed by Lake Fork and the Dan Chene river, not only the Uinta group but both the Green river, and Bridger groups also, are well developed, each possessing all its peculiar and usual characteristics as seen at the typical localities in the great Green river basin, north of the Uinta mountains. This added to the known existence of Bridger strata in White river valley, and the extensive area occupied by the Green river group, between White and Grand rivers, has added very largely to our knowledge of the southward extension of those formations.

In all the comparative examinations of the formations or groups of strata that have just been indicated, he has paid special attention to their boundaries, or planes of demarkation; crossing and recrossing them wherever opportunity offered, noting carefully every change of both lithological and paleontological characters. While he has been able to recognize with satisfactory clearness the three principal groups of cretaceous strata, namely, the Dakota, Colorado and Fox hills, on both sides of the Rocky and Uinta mountains respectively, they evidently constitute an unbroken series, so far as their origin by continuous sedimentation is concerned. While each of the groups possesses its own peculiar paleontological characteristics, it is also true that certain species pass beyond the recognized boundaries of each within the series.

The stratigraphical plane of demarkation between the Fox hills, the uppermost of the undoubted cretaceous groups and the Laramie group, the so-called post-cretaceous, is equally obscure; but the two groups are paleontologically very distinct, inasmuch as the former is of marine origin, while the latter, so far as is now known, contains only brackish water and fresh water invertebrate forms. He reports a similar obscurity or absence of a stratigraphical plane of demarkation between the Laramie and Wasatch groups, although it is there that the final change from brackish to entirely fresh waters took place over that great region. Furthermore, he finds that while the three principal groups of the fresh water tertiary series, west of the Rocky mountains, namely, the Wasatch, Green river, and Bridger groups, have each peculiar characteristics, and are recognizable with satisfactory distinctness as general divisions, they really constitute a continuous series of strata, not separated by sharply defined planes of demarkation, either stratigraphical or paleontological.

During the process of the field work as above indicated, large and very valuable collections of fossils have been made, all of which will constitute standards of reference in the future progress of the work, and quite a large number of the species are new to science. These are now being investigated, and will be published in the usual paleontological reports of the survey.

WOODWARD'S GARDENS has the following new attractions: The buffalo chase; large whale skeleton; new museum; improvements in the zoological department, besides the other features which have made it popular.

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**TAXES.**

1877-1878.

Notice is hereby given, that a certified copy of the Assessment Book of the Taxable Property of the City and County of San Francisco, Real Estate and Personal Property (Subsequent Assessment Book included), for the Fiscal Year 1877-78, has this day been received; that the State, City and County TAXES for said fiscal year are now due and payable at the office of the undersigned, Room No. 1, City Hall, and the Laws in regard to their collection will be strictly enforced.

Taxes will become delinquent on the FIRST MONDAY in January, 1878, and unless paid prior thereto, Five per cent. will be added to the amount thereof.

WM. FORD,

Tax Collector of the City and County of San Francisco.

SAN FRANCISCO, October 22, 1877.

**Montgomery Avenue Tax.**

Notice is hereby given that a certified copy of the Assessment Book of Real Estate, which is subject to Assessment to defray expenses incurred by the opening of Montgomery Avenue, has this day been placed in my hands to collect Taxes thereon.

Said taxes are for the Fiscal Year 1877-78, and are now due and payable at the office of the undersigned, Room No. 1, City Hall. All Taxes remaining unpaid on the FIRST MONDAY of January, 1878, will have Five per cent. added thereto.

WM. FORD,

Tax Collector for the City and County of San Francisco.

SAN FRANCISCO, October 22, 1877.

**ASSESSMENT OF LANDS**

**Benefited by Widening Dupont St.**

Notice is hereby given, that a certified copy of the Assessment Book of the Real Estate which is subject for the payment of Principal and Interest upon "Dupont-Street Bonds," as directed by an Act of the Legislature of California to authorize the Widening of Dupont Street in the City of San Francisco, "Approved March 23, A. D. 1876," has this day been placed in my hands for collection. The Laws in regard to the collection of the same will be strictly enforced.

WM. FORD,

Tax Collector of the City and County of San Francisco.

SAN FRANCISCO, October 22, 1877.

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25 NEW YEAR CARDS, with name, 20c. 25 Extra Mixed, 10c. GEO. I. REED & CO., Nassau, N. Y.



Continued from Page 389.

the locators enthuse over it as the "biggest thing in the mountains." Larkin calls it the Queen of Hearts. W. R. Hellings has sold the Golden Star mine, in Cave Creek mining district, for \$75,000. San Francisco parties are the buyers.

### Oregon.

**STERLING DITCH.**—Oregon Sentinel, Dec. 12: Work on the Sterling ditch is being pushed so vigorously that it is anticipated that water will be running through the pipe before the expiration of another week.

**ENTERPRISE.**—Messrs. Smith & Courtney are engaged in sinking a shaft on the divide where crossed by the Applegate road, south of town. They expect to strike the channel that fed Rich gulch.

**THE EMBELINE.**—We learn from Mr. M. Caton, the Superintendent of the Embeline quicksilver mine, that the amount of ore reported this fall was 11,225 pounds, and the yield in quicksilver 6,273 pounds, or nearly 57%. The company is now sinking on good ore, and expect to make a profitable run in the spring.

**RICH ORE.**—Prof. Tierman, the mining expert, passed north on Monday. He had just returned from an examination of the quartz mine near Brownstown, opened a couple of years ago by an individual named Kelly, and abandoned as unprofitable. The Professor mined 650 pounds of rock taken without selection from the dump, and cleaned up \$32, making a yield of \$96 per ton.

### New Incorporations.

The following companies have filed certificates of incorporations in the County Clerk's office, at San Francisco.

**BOOKER G. M. Co.**—Dec. 19th.—Capital stock, \$1,000,000. Directors—John Neale, F. Homer, Hy. Williams, S. M. Boone and J. P. Fouse.

**ROYAL ARCH M. Co.**—Dec. 11th. Capital stock, \$12,000,000. Directors—Mark M. McDonald, J. G. Riley, C. H. Silberman, John L. Murphy and Philip Corcoran.

**EXCHANGE M. & M. Co.**—Dec. 20th. Locat on: Nevada. Capital stock, \$200,000. Directors—T. B. Fargo, W. J. Smith, E. McGary, James Morgan and B. F. Jefferson.

**OAKLAND M. Co.**—Dec. 19th. Capital stock, \$300,000. Directors—J. W. Thompson, John Krutz, C. C. Riser, W. H. Sibaeker and D. P. Blue.

**PARK'S GRAVEL M. Co.**—Dec. 10th. Locat on: Cal. Capital stock, \$100,000. Directors—H. P. Gregory, C. W. Banks, G. W. Cummings, D. P. Bellnap and A. Jenks.

**SPALDING G. & S. M. Co.**—Dec. 19th. Locat on: Mono county, Cal. Capital stock, \$10,000,000. Directors—A. F. Bryant, W. A. Seales, L. Slessonger, G. C. Carter and J. Berolzheimer.

### News in Brief.

NEW YORK is having a cat show.

CONGRESS has adjourned until January 10th. The Senate has passed the five-cent car-fare bill.

THE revolution in San Domingo is rapidly spreading.

A MOVE is on foot to establish a mechanics' institute in Oakland.

IT is expected that Oakland will have a free postal delivery next year.

THE amount of customs dues paid at this port last week was \$68,331.

THE Tennessee Senate proposes to pay 50 cents on the dollar of the State debt.

FOR the year ending Nov. 30th, there were 703,658 visitors at the Golden Gate park.

BEN. HOLLADAY'S daughter, the Baroness de Bussiere, died in New York on Sunday.

THE old Watts tannery, on Peralta street, Oakland, was destroyed by fire on Sunday last.

GOVERNOR McCORMICK has been unanimously confirmed as Commissioner-General to the Paris exposition.

THE Sheffield (Eng.) iron workers have received notice of a reduction of wages after the holidays.

THE British expeditionary force from the predatory Naga tribes have occupied their principal village.

THE San Jose Argus complains of the prevalence of diphtheria in that city. It also prevails in Visalia.

A BABY show to last one week is announced to be opened at Pacific hall, in this city, on Monday, January 14th.

THE aggregate deficiency of the several funds and accounts of this city is \$156,572, the largest being that of the street department, \$108,000.

ABOUT 2,500 sacks of grain were saved from the barge Governor Hayes, which sunk in the Sacramento river last week.

IT has been snowing heavily in the Balkan mountains and the "passes" have been rendered impassable to troops.

THE Treasury now holds \$345,593,550 in bonds to secure national bank circulation, and \$14,038,000 to secure public deposits.

THE cargo has been all taken out of the wrecked steamer *Continental*, at Bel river, but the vessel will probably be a total loss.

TYLER, of Collateral Savings Bank notoriety has decamped, and his bonds, amounting to \$29,000 have been declared forfeited.

THE rain of last Friday and Saturday was so violent on the Colorado desert that several miles of railroad track was washed away.

A NATCHES, Miss., editor has got ahead of his professional brethren elsewhere by being the first one to call his paper the *Telephone*.

A CHICKEN ranchman named Carlo, residing out on the San Bruno road, was murdered for his money last Saturday night. The murderers were not caught.

THE *Territorial Enterprise* declares the labor market of the Comstock to be over-crowded and discourages any further influx of working-men to that quarter.

THE Castle Garden Labor Exchange, New York, provided 893 immigrants with employment last month. The average wages for farm laborers were \$8 a month, with board, and day laborers \$1.25 per day.

COLONEL WELLESLEY, the British Military Attache, says that Osman Pasha had less than 30,000 men at Plevna, and in his sortie lost 6,000 in killed and wounded.

SIXTY THOUSAND more Russians are to be mobilized.

THE British Parliament has been called to meet January 17th.

THE Indians about Healdsburg are to be taken to the Round Valley reservation.

THE new Commissioner of Indian Affairs, Hoyt, has taken the oath of office.

OVER 1,000 Chinamen left this city for China this month, by steamer and sailing vessels.

THE Columbia salmon hatchery is reported to be in successful operation.

SENATOR JONES thinks the silver bill will pass the Senate by a large majority.

THE Pope has granted a dispensation, authorizing the marriage of the King of Spain with the Princess Mercedes.

THE schooner *Marietta* was wrecked on Humboldt bar on Sunday evening. Vessel a total loss, but all hands saved.

A VIOLENT cloud burst occurred in Brea canyon, Los Angeles county, on Tuesday. A man who was driving up the canyon was drowned.

THE naval court of inquiry into the *Huron* disaster, concluded that it was the fault of the officers through errors in navigation.

THE *Christian Ballot* is the name of a new "prohibitory" temperance paper by Jesse Hohnson, San Jose.

Two or three thousand workmen, engaged on the enlargement of the Lachine canal, Canada, have struck and quit work.

A PROJECT is on foot by the Government to obtain the money and property that belonged to the Confederacy, which is now said to be in Europe.

THE jury in the Creighton murder case, at Cincinnati, after a deliberation of 26 hours, returned a verdict of manslaughter, which is considered a compromise verdict.

IT is generally believed in Constantinople that the Porte's plea for mediation of the Powers will have no result. England will continue to observe neutrality.

THE National Reform Convention to advocate an express acknowledgement of God in the Constitution, met at Rochester, N. Y., on Tuesday. Two hundred delegates were present.

A LARGE majority of the Northumberland collieries have stopped work, as the men seemed determined to resist the proposed reduction of 12½% in their wages.

THE prospect of the House now seems quite good for the passage of a bill extending for ten years the time allowed to the Northern Pacific Railroad Company to complete its line.

THE remains of an elegantly dressed child, about a week old, were dug up on Summit street, Virginia City, on Saturday, encased in a soap-box. It was found that the child had been murdered.

THE House Committee on Indian Affairs substantially agreed to report a bill on the re-assembling of Congress, allowing five Indian tribes in the Indian Territory to be represented by a delegation in the House.

THE Russian Minister of Finance has notified loan contractors that he has determined not to receive the second installment of the war loan, amounting to 15,000,000 marks, an option of refusing which he had reserved.

A COMMITTEE of the National Association of General Railway Passenger Agents, at a meeting at Chicago, have reported in favor of discontinuing all excursion rates and tickets at all seasons of the year.

THE shipments of treasure overland by Wells, Fargo & Co. during the first half of the current month were \$2,077,250, of which \$1,095,500 was silver coin and \$854,100 gold coin. The quantity of silver shipped is unusually large.

A WASHINGTON special says: The President's message on the Civil Service, which will be ready to send to Congress soon after the holidays, will show that the President does not intend to surrender any of the positions which he has assumed in his controversy with the Senate.

Two sailing ships and a steamer will sail in February and March, under direction of the Secretary of the Navy, with goods for the French International exposition. The Commissioner of Agriculture will prepare an extensive display of cotton, tobacco, wool, Indian corn, sugar, rice and other products of this country.

THE Secretary of War says the disturbance on the Texan border has not the semblance of a National trouble. He looks upon it as a purely local question, incident to the locality and imperfect civilization of the people living on the border. Troops have been ordered to the scene of disturbance, and will restore peace without trespassing upon Mexican territory.

THE financial troubles among the fine stock breeders of the Kentucky blue grass region are becoming widespread. The difficulty began some time ago with the failure of B. Groom & Son, with liabilities at over \$300,000. The custom among stock men of becoming sureties has complicated matters to such an extent that nearly all the leading firms are involved.

THE suit of the San Pablo and Tulare R. R. Co., vs. L. L. Robinson for condemnation of the right of way over the New York ranch has been decided. Judge Dwinelle instructed the jury that the plaintiff had the power to exercise the right of eminent domain, and that the uses to which the property was sought to be condemned were public uses. In the verdict there were 19 findings, the first affirming that the lands were necessary to the construction of the railroad, and the remainder assessing the damages, all which collectively amount to \$24,257.45.

It is proposed to increase the British army. The Los Angeles Herald estimates the area in that county sown with wheat this season at 20,000 acres.

JAMES T. FARLEY has been elected Senator from California. Hon. M. M. Estee received the complimentary votes of the Republicans.

MINING ground along the Comstock range is being pretty closely looked after at present and new locations are being recorded almost every day.

THE Cosmopolitan Dime savings bank has collapsed. The aggregate loss is not large, but the depositors are from the poorer classes and the blow is therefore very heavy.

THE Porte has instructed its Minister at Rome to ask for an explanation of the relations, which are growing more and more intimate, between Italy and Greece.

### Mining Share Market.

There has been nothing of special interest in the stock market during the week, and business appears to be slackening off as the holidays approach. The annual meeting of the Opbir company was held on Thursday afternoon, the usual reports were read and accepted. That of President Weller speaks hopefully of the future, stating that the mine is free of debt and has even \$30,000 on hand in coin and bullion.

The meeting proceeded to the election of officers for the ensuing year. The old board, with the substitution of A. K. P. Harmon for John P. Jackson, was re-elected.

The principal item of interest in stock circles is the Justice investigation. In this connection the Gold Hill News says: The Justice investigating committee have completed the first instalment of their labors at the mine, and have gone back to San Francisco to investigate Schultz some more, and put this and that together. They feel sure that they have unearthed a vast amount of high grade rascality, and find that the company will still be over \$350,000 in debt after the present delinquent assessment is fully paid in. Schultz says the new management have not acted in good faith with him; that they have brought charges which they cannot sustain, and anyhow will not look so dreadfully bad when properly and fully explained. The report of the committee will be made public in due time, and then the full and complete explanation of Mr. Schultz will be in order. Meanwhile, Superintendent Curtis is going ahead with the working of the mine, as he thinks ought to be done, and he does know as much as anybody about such matters. Justice will come out on her own bottom hereafter, although there may be another assessment required to clean up the indebtedness.

CONCLUDED.—We conclude this week Mr. Bowie's excellent article on Hydraulic Mining. The tables which appeared last week, with those given in this issue are exceptionally valuable to all interested in this kind of mining, and will repay careful perusal. Those in this issue particularly afford a fair basis for comparison, since they show the results in detail where the gravel is comparatively poor and the fall slight. Mr. Bowie's treatise is the most exhaustive on the subject and has been conscientiously and carefully handled, he having brought together a large number of valuable facts from his own experience and that of others familiar with the subject. We are glad to have been able to have presented so interesting a series of articles to our readers.

WATER RIGHTS.—Assemblyman Swift has introduced an Act to amend the Civil Code with respect to water rights. It is intended by the author to put a stop to the speculative appropriation of water. It provides that water may be appropriated for municipal, agricultural, mining and manufacturing purposes, but water for municipal purposes can only be appropriated by the city or town when it is to be used for the public use. Water for agricultural purposes may be appropriated for the use of a district by the land-owners of a district for the common use of all, or it may be appropriated by any land-owner or land-owners for the use of the land they own. The same rule applies to mines as manufacturing. No person can appropriate water to sell or speculate in it, unless he puts it to some beneficial use and when that is done his right ends. Water once brought upon land becomes attached to it and cannot be used away from it, but any sale of the land carries the water with it.

THE FLOUR PATENTS.—In the case of Cochran et al. vs. Deever et al. from the Supreme Court of the District of Columbia, the United States Supreme Court rendered a decision, denying the motion to set aside the decree and dismiss the bill. This is known as the patent process flour case, and it was charged that there had been collusion between the parties prior to the hearing and to such extent as would be taken notice of as affecting the decree. The Court failed to find any evidence of collusion, but it said that, under the circumstances, third parties who had no opportunity of being heard and whose interests, as opposed to the Cochran patents, are very important, should not be excluded from moving for a further hearing whenever a future case may be presented for consideration.

### Lady Bryan.

The annual meeting of the Lady Bryan mining company was held on Tuesday. There were six stockholders present, but with their own, and the proxies they held, shares to the amount of \$52,890 were represented, \$32,695 of the new issue and the balance of the old stock. Martin Jones was in the chair. A resolution commending the action of the stockholders in diminishing the capital stock of the company since the last annual meeting was passed. A written protest was handed in by certain dissatisfied stockholders against the holding of the meeting, on the ground that the Secretary and others were voting by proxy in the name of stockholders from whom proxies had not been obtained, and that there are no shares of stock out except those enjoined by civil process of the courts. The Chairman directed the Secretary to note on the protest that the parties presenting it do not represent one dollar's worth of stock according to the books of the company. Trustees for the ensuing year were elected as follows: C. R. Merrill, James A. Baker, Martin Jones, John Van Orden and L. I. Mowry. An amendment to the by-laws was then passed, giving power to the Directors to sell stock that may come into their hands by delinquencies of assessment, or any other way, without reference to the stockholders.

BULLION SHIPMENTS.—Since our last issue shipments of bullion from the prominent mines have been as follows: Tybo Con., Dec. 10th, \$4,039.89; Alps, 14th, \$1,822; Gila, 10th, \$7,061; Arizona, Dec. 13th, \$918.81; California, 12th, \$192,222.52; Con. Virginia, 15th, \$161,866.49; Northern Belle, 12th, \$3,429.36; Edwinton, 17th, \$2,259.08; Tybo, 12th, \$4,083.56; Grand Prize, 17th, \$267; Martin White, 17th, \$20,166; Manhattan, 18th, \$3,400; Northern Belle, 15th, \$5,150.67; Arizona, 17th, \$1,265.52; Leopard, 18th, \$4,300; Alps, 19th, \$1,531.

SENATE concurrent resolution No. 43, providing for a general State election on the question of Chinese immigration has been amended to read "general or special election" and adopted by the Assembly.

THE telegraph informs us that the Nevada quicksilver works at Steamboat Springs are proving a success. The first shipment of 20 flasks was made this week.

They have found petroleum in the Black hills said to be superior to that of West Virginia.

### METALS.

[WHOLESALE.]

THURSDAY, M., December 20, 1877.

IRON—		
American Pig, ton.....	28 00	@ 32 00
Scotch Pig, ton.....	32 00	@ 33 00
White Pig, ton.....	28 00	@ 30 00
Oregon Pig, ton.....	—	—
Refined Bar.....	34 00	@ 65
Horse Shoes, keg.....	5 00	@ 12
Nail Rod.....	—	@ 73
Norway, Oval.....	—	@ 74
Rolled.....	—	@ 74

COPPER—		
Copper Tinned.....	37 00	@ 40
Sheathing, lb.....	37 00	@ 40
Sheathing, Yellow.....	21 00	@ 22
Sheathing, Old Yellow.....	10 00	@ 11
Composition Nails.....	21 00	@ 21
Composition Bolts.....	14 00	@ 18

STEEL—		
English Cast, lb.....	14 00	@ 5
Anderson & Woods, ordinary sizes.....	16 00	@ 16
Drill.....	16 00	@ 16
Flat Bar.....	15 00	@ 15
Plow Steel.....	8 00	@ 12

TRIPPLES—		
By the Cask.....	8 50	@ 9 00
Banca Tin.....	24 00	@ 24
Australian.....	19 00	@ 20

ZINC—		
By the Cask.....	11 00	@ 11
Zinc Sheet 7½ ft. 7 to 10, lb.....	11 00	@ 11
7½ ft. 11 to 14.....	11 00	@ 11
8½ ft. 8 to 10.....	12 00	@ 12
8½ ft. 11 to 10.....	12 00	@ 12

QUICKSILVER—		
By the lb.....	3 00	@ 25
	47 1/2	@ 50

### LEATHER.

[WHOLESALE.]

WEDNESDAY M., December 19, 1877.

Sole Leather, heavy, lb.....	28 00	@ 29
Good French Calf.....	22 00	@ 24
Jodot, 8 Kil. doz.....	48 00	@ 50 00
11 to 13 Kil.....	65 00	@ 76 00
14 to 19 Kil.....	80 00	@ 90 00
Second Choice, 11 to 16 Kil.....	80 00	@ 90 00
Corneillon, 12 to 16 Kil.....	57 00	@ 67 00
Females, 12 to 13 Kil.....	63 00	@ 67 00
14 to 16 Kil.....	71 00	@ 76 50
Simon Ullmo, Females, 12 to 13 Kil.....	58 00	@ 62 00
14 to 15 Kil.....	68 00	@ 72 00
16 to 17 Kil.....	72 00	@ 74 00
Simon, 18 Kil.....	61 00	@ 63 00
20 Kil.....	65 00	@ 67 00
24 Kil.....	68 00	@ 70 00
Sheep, 7 and 9 Kil.....	40 00	@ 40 00
Kips, French, lb.....	1 00	@ 1 35
Cal. doz.....	40 00	@ 40 00
French Sheep, all colors.....	3 00	@ 41 50
Eastern Calf for Backs, lb.....	1 00	@ 1 25
Sheep Roans for Topping, all colors doz.....	9 00	@ 13 00
For Linings.....	5 50	@ 10 50
Cal. Russet Sheep Linings.....	1 75	@ 4 50
Boot Legs, French Calf, pair.....	4 00	@ 4 75
Best Jodot Calf.....	5 00	@ 5 25
Leather, Harness, lb.....	35 00	@ 38
Fair Bridle, doz.....	48 00	@ 72 00
Skinning, lb.....	33 00	@ 37
Buff, ft.....	18 00	@ 20
Wax Side.....	17 00	@ 18

### Gold, Legal Tenders, Exchange, Etc.

[Corrected Weekly by SUTRO & Co.]

SAN FRANCISCO, December 19, 3 P. M.  
LEGAL TENDERS: U. S. F., H. A. M., 97½ @ 97½. SILVER, 4½ @ 4½.  
GOLD IN NEW YORK, 103.  
GOLD BARS, 830 @ 810. SILVER BARS, 80 @ 81 cent. discount.

EXCHANGE on New York, 1½; on London bankers, 4½; Commercial, 50; Paris, five francs @ dollar; Mexican dollars, 94.  
LONDON Consols, 95 3/4; Bonds, 100½.  
QUICKSILVER in S. F., by the flask, ½ lb, 42 @ 47½.



## Signal Service Meteorological Report.

Week Ending December 18, 1877.

HIGHEST AND LOWEST BAROMETER.						
Dec. 12	Dec. 13	Dec. 14	Dec. 15	Dec. 16	Dec. 17	Dec. 18
30.14	29.97	29.83	29.01	29.90	29.85	29.98
30.03	29.89	29.77	29.81	29.81	29.79	29.87
MINIMUM AND MAXIMUM THERMOMETER.						
60	63	64	64	61	60	57
49	50	53	53	54	54	51
MEAN DAILY HUMIDITY.						
71	60	60	74	84	84	81
PREVAILING WIND.						
NW	NW	NW	SW	SE	SE	W
WIND—MILES TRAVELED.						
113	133	140	80	131	250	113
STATE OF WEATHER.						
Clear.	Fair.	Cl'ody.	Clear	Rainy.	Rainy.	Fair.
RAINFALL IN TWENTY-FOUR HOURS.					23	.99
Total rain during the season, from July 1, 1877, 3.69 in.						

## OUR AGENTS.

Our friends can do much in aid of our paper and the cause of practical knowledge and science, by assisting Agents in their labors of canvassing, by lending their influence and encouraging favors. We intend to send one but worthy men.

J. L. THARP—San Francisco.  
B. W. CROWELL—California.  
A. C. KNOX—Pacific Coast.  
C. N. WEST—Santa Cruz, Monterey and San Benito counties.  
A. C. CHAMBER—Tulare, Fresno and Inyo counties.  
JOSEPH DIMMICK—Mendocino, Humboldt and Del Norte counties, and Oregon.  
W. D. WHITE—San Bernardino and Los Angeles counties.  
J. W. A. WRIGHT—Sacramento, Placer and San Joaquin counties.  
B. E. LLOYD—Alameda, Contra Costa and Napa counties.  
E. M. DENNY, Oregon.  
F. B. ALDERSON, Nevada.  
H. E. HALL—San Joaquin, Yolo, Yuba, Sutter and Colusa counties.

## TO QUERISTS.

In propounding questions to the editorial, patent or business departments of this office, letter writers should be careful to enclose a stamp and addressed envelope if they wish prompt answer. If we were to furnish time, paper, envelopes and stamps, all free to parties who address this office on matters of more interest to themselves than to us, FIVE HUNDRED DOLLARS A YEAR would not cover the expense. This hint, however, is not intended for parties writing in our own or the public interest, or who would be obliged to delay writing at any time for want of an extra stamp.

Any person receiving this paper after giving an order to stop it, may know that such order has failed to reach us, or that the paper is continued inadvertently, and they are earnestly requested to send written notice direct to us. We aim to stop the paper promptly when it is ordered discontinued.

## TWENTY-FIFTH YEAR—1878.

## Hall's Journal of Health.

## Contents of a Single Number:

The Little Courtesies of Life; Coughing in Consumption; Influence of Christianity on Medical Science; Ignorance and Ill Health; Rage and Ruin; Kindness the Best Punishment; Grass in Rum; Valuable Table; Incurable Insanity; Consumption—A Suggestion; The Spirit Rapper; Premium on Babies; Our Proverbs; Wrecked Clergymen; Marrying Well; The Lifting Cure; Sea Sickness; Face Painting; A Filthy Atmosphere; The Latest Crazy Man; A Suggestion; The Erie Railway; Sick Children.

Published in New York. E. H. GIBBS, M. D., Editor.

This journal has maintained the highest record of any health journal issued in the English language. It is not the amount of matter published which makes it the most valuable journal, but the plain and condensed truths it furnishes concerning that which is of ever vital importance to its large list of readers.

Annual subscription (post-paid).....\$1.50.  
To subscribers of this paper.....75 cents.

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No. 202 Sansome Street, San Francisco,  
Agents on the Pacific Coast.

UNITED STATES  
Mineral Land Laws, Revised Statutes,  
AND INSTRUCTIONS AND FORMS  
UNDER THE SAME.

We have just issued a pamphlet containing the General Mineral Land Laws of the United States, with instructions of the Commissioner of the Land Office. The contents of this pamphlet comprise all of the Government laws with relation to mineral lands of interest to the mining community, as follows: Mining Statute of May 10th, 1872, with instructions by the Commissioner of the Land Office; Mining Statute of July 26th, 1866; Mining Statute of July 9th, 1870. Forms required under Mining Act of May 10th, 1872, as follows: Notice of Location; Request for Survey; Application for Patent; Proof of Posting Notice and Diagram of the Claim; Proof that Plat and Notice remained Posted on Claim during Time of Publication; Registers' Certificate of Posting Notice for Sixty Days; Agreement of Publisher; Proof of Publication; Affidavit of \$500 Improvements; Statement and Charge of Fees; Proof of Ownership and Possession in Case of Loss or absence of Mining Records; Affidavit of Citizenship; Certificate that no Suit is Pending; Power of Attorney; Protest and Adverse Claim; Non-Mineral Affidavit; Proof that no Known Veins Exist in a Placer Claim, etc. There is also given the U. S. Coal Land Law and Regulations thereunder. The work comprises thirty pages, and will be sold, post-free, for 50 cents. It should be in the hands of every one having any mining interests. DEWEY & CO.,  
Publishers of the MINING AND SCIENTIFIC PRESS, S. F.

## A JOB PRESS WANTED.

Any printer having an Eighth or Quarter Medium Job Press for sale, will please address J. P., care of Dewey & Co., S. F. State condition and lowest price.

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TRADE

## MARKS.

The U. S. Government now offers greater protection than formerly to manufacturers under the law of Trade Marks. Those who manufacture a superior article, or put up improved packages of merchandise, should protect themselves from imitations by registering their Trade Marks. We have special facilities for securing full rights by the registration of Trade Marks, and our terms are very reasonable.

Consultations free. Many dealers have missed fortunes from not being fully informed and protecting themselves in their rights.

DEWEY & CO., Patent Solicitors,  
No. 202 Sansome Street, S. F.

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Among the advantages gained by this holder are the following:

It can be opened and closed quickly.  
The points are less obstructed while the articles to be filed are being placed.

The papers (wholly or partly folded) can be either "straddled" over the lower bar, or filed in regular book order.

The elastic hinge and band accommodate and hold firm either a large or small number of papers.

With less material, it is lighter and less cumbersome than other holders, and approaches nearer to bookbinding.

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It has proved durable in practice. The file is adjusted but 52 times a year for a weekly paper, and a sample holder can be opened and closed 1,000 times without showing wear.

Five sizes are made to suit the dimensions of different papers, viz.: 18, 22, 26, 30 and 34 inches, inside measure. Single samples will be mailed from this office for 50 cents, postpaid. Wholesale and retail agents wanted.

## To Mining Secretaries.

An amendment to Section 336 of the California Code, taking effect July 1st, 1874, provides that in addition to the regular publication, daily or weekly, of the assessment and sale notices as heretofore,

## PERSONAL NOTICE

Must be served as provided in the following quotation from the law:

"The notice must be personally served upon each stockholder, or in lieu of personal service, must be sent through the mail, addressed to each stockholder at his place of residence, if known, and if not known, at the place where he principal office of the Corporation is situated."

The above refers to the ASSESSMENT NOTICE only. Advertisers in the MINING AND SCIENTIFIC PRESS will be furnished with copies of assessment notices printed on slips suitable for serving personal notice under this law at short notice.

DEWEY &amp; CO., Publishers.

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and  
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This Office.

We are prepared to do fine Wood Engraving for illustrating Landscape Scenery, Buildings, Machinery, Works of Art, Manufactured Articles, Trade Marks, Seals, etc. We have a first-class

## Machine for Engraving

A portion of the work, which can be finished thereby more perfectly than by the eye and hand alone. Our patrons can depend upon first-class work always, and at reasonable prices. Samples can be seen at our office.

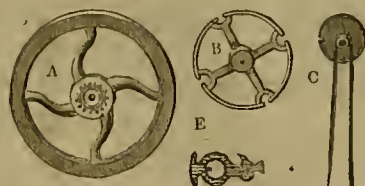
DEWEY &amp; CO.

The Large Circulation of the MINING AND SCIENTIFIC PRESS extends throughout the mining districts of California, Nevada, Utah, Colorado, Arizona, Idaho, Montana, British Columbia, and to other parts of North and South America. Established in 1860, it has long been the leading Mining Journal of the continent, its varied and reliable contents giving it a character popular with both its reading and advertising patrons.

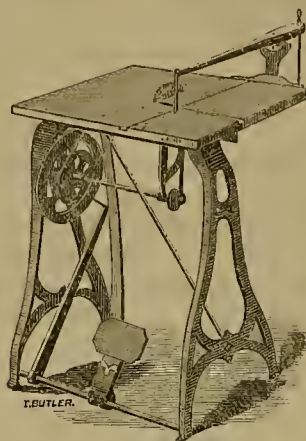
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BARNES' PATENT.

LATHES,  
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CIRCULAR SAWS,  
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And MORTISING MACHINES.

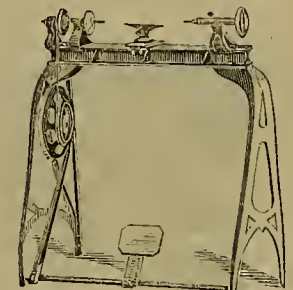


Movement of Foot-Power Combination.



Combined Circular &amp; Scroll Saw, \$40.

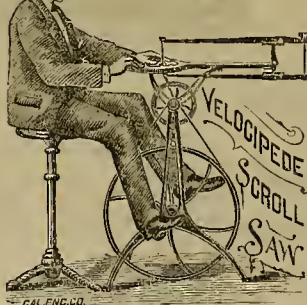
SCROLL SAW, ONLY \$25.00.



Iron Bed Lathe, with Slide Rest, \$50.

Wood Bed Lathe, \$35.

PRICE, \$15.



This Saw is Used Very Extensively for  
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Foot & Hand Scroll Saws, Various Styles  
Patterns for Scroll Sawing.

SAW BLADES,

FANCY WOODS,

All kinds—One-Eighth, Three-Sixteenths, One-Quarter  
and One-Half Inch Thick.

Mechanics' Tools and Hardware.

OSBORN &amp; ALEXANDER,

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Send for Price List and Catalogue.

## Mining and Other Companies.

Persons interested in incorporated shares will do well to recommend the publication of the official notices of their companies in this paper, as the cheapest appropriate medium for the same.

**Advance Silver Mining Company.**—Location of principal place of business, San Francisco, California. Location of works, Monitor District, Alpine County, Cal.

Notice is hereby given that at a meeting of the Board of Directors, held on the twenty-first day of November, A. D. 1877, an assessment of fifty (50) cents per share was levied upon the capital stock of the corporation, payable immediately in U. S. gold coin, to the Secretary, at the office of the company, Room 16, No. 309 California Street, San Francisco, Cal.

Any stock upon which this assessment shall remain unpaid on the second day of January, 1878, will be delinquent and advertised for sale at public auction, and unless payment is made before, will be sold on the twenty-sixth day of January, 1878, at 2 P. M. to pay the delinquent assessment, together with costs of advertising and expenses of sale.

B. LINGLEY, Secy.  
Office, Room 16, No. 309 California St., San Francisco, Cal.

**California and Oregon Land Company.**—Location of principal place of business, San Francisco, Cal. Location of works, Jackson County, Oregon.

Notice.—There is delinquent upon the following described stock, on account of assessment No. 1, levied on the seventeenth day of October, 1877, the several amounts set opposite the names of the respective shareholders, as follows:

Names	No. Certificates	No. Shares	Am't.
Allen, J. O., Administrator Estate of Isaac Allen	08	500	\$175 00
Belcher, W. C.	48	500	175 00
Belcher, W. C.	49	500	175 00
Belcher, W. C.	50	500	175 00
Clark, J. W., Trustee	125	1000	350 00

And in accordance with law, and an order of the Board of Directors, made on the seventeenth day of October, 1877, so many shares of each parcel of such stock as may be necessary, will be sold at public auction, at the office of the company, Room 2, No. 415 California Street, San Francisco, California, on Monday the twenty-fourth day of December, 1877, at the hour of two o'clock P. M., of aid day, to pay said delinquent assessment thereon, together with costs of advertising and expenses of sale.

J. W. CLARK, Secy.

**Manzanita Gold Mining Company.**—Location of principal place of business, San Francisco, California. Location of works, Sulphur Creek, Colusa County, Cal.

Notice is hereby given that at a meeting of the Board of Directors, held on the third day of December, 1877, an assessment, (No. 1.) of ten (10) cents per share was levied upon the capital stock of the corporation, payable immediately in U. S. gold coin, to the Secretary, at the office of the company, No. 51 Fremont Street, San Francisco, Cal.

Any stock upon which this assessment shall remain unpaid on the eighth day of January, 1878, will be delinquent and advertised for sale at public auction, and unless payment is made before will be sold on Thursday, the thirty-first day of January, 1878, to pay the delinquent assessment, together with costs of advertising and expenses of sale. By order of the Board of Directors, GEO. S. SPRATT, Secy.

Office, 51 Fremont Street, San Francisco, Cal.

**New Basel Consolidated Gravel Mining Co.**—Principal place of business, San Francisco, Cal. Location of works, Placer County, Cal.

Notice is hereby given that at a meeting of the Board of Directors, held on the tenth day of November, 1877, an assessment of seven and one-half (7 1/2) cents per share was levied upon the capital stock of the corporation, payable immediately in U. S. gold coin, to the Secretary, at the office of the company, 610 Merchant Street.

Any stock upon which this assessment shall remain unpaid on the twenty-eighth day of December, 1877, will be delinquent and advertised for sale at public auction, and unless payment is made before, will be sold on Monday, the fourth day of January, 1878, to pay the delinquent assessment, together with costs of advertising and expenses of sale. D. F. LEGAYE, Secy.

Office, 610 Merchant Street, San Francisco, Cal.

**Summit Mining Company.**—Location of principal place of business, San Francisco, California. Location of works, Mineral Point Mining District, Plumas County, California.

Notice is hereby given, that at a meeting of the Board of Directors, held on the tenth day of December, 1877, an assessment (No. 1.) of five (5) cents per share was levied upon the capital stock of the corporation, payable immediately in U. S. gold coin, to the Secretary, at the office of the company, 415 California Street, San Francisco, Cal.

Any stock upon which this assessment shall remain unpaid on the twenty-first day of January, A. D. 1878, will be delinquent and advertised for sale at public auction, and unless payment is made before, will be sold on Tuesday, the twenty-sixth day of February, A. D. 1878, to pay the delinquent assessment, together with costs of advertising and expenses of sale. By order of the Board of Directors, J. W. CLARK, Secy.

Office, Room 2, No. 415 California Street, San Francisco, Cal.

**Timmy Chub Mining Company.**—Location of principal place of business, San Francisco, California. Location of works, Cornet Mining District, Los Angeles County, California.

Notice is hereby given that at a meeting of the Board of Directors, held on the fourth day of December, 1877, an assessment, (No. 1.) of fifty cents per share was levied upon the capital stock of the corporation, payable immediately in U. S. gold coin, to the Secretary, at the office of the company, Room 25, Nevada Block, San Francisco, Cal.

Any stock upon which this assessment shall remain unpaid on the fourth day of January, 1878, will be delinquent and advertised for sale at public auction, and unless payment is made before, will be sold on Monday, the twenty-first day of January, 1878, to pay the delinquent assessment, together with costs of advertising and expenses of sale. By order of the Board of Directors, G. C. PRATT, Secy.

Office, Room 25, Nevada Block, San Francisco, Cal.

**The Welch Consolidated Quicksilver Mining Co.**—Principal place of business, San Francisco, Cal. Location of works, Mount Diablo Mining District, Contra Costa County, Cal.

Notice is hereby given that at a meeting of the Board of Directors, held on the fifth day of December, 1877, an assessment, (No. 1.) of ten (10) cents per share was levied upon the capital stock of the corporation, payable immediately in U. S. gold coin, to the Secretary, at the office of the company, Room 7, No. 420 Montgomery Street.

Any stock upon which this assessment shall remain unpaid on the seventh day of January, 1878, will be delinquent and advertised for sale at public auction, and unless payment is made before, will be sold on Monday, the twenty-first day of January, 1878, to pay the delinquent assessment, together with costs of advertising and expenses of sale.

J. F. FORBES, Secy.

Office, Room 7, No. 420 Montgomery St., San Francisco, Cal.

**To Ship and Engine Builders, Steamship Companies, Etc.**

A Mechanical Engineer, having an extensive experience in Marine Engineering (especially compound) and Iron Ship Building, also in Steam Engines and Machinery in general, is open for engagement. First-class references. Address and references can be obtained at office of Scientific Press.



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Are prepared to make SHEET IRON AND ASPHALTUM PIPE, of any size and for any pressure, and contract to lay the same where wanted, guaranteeing a perfect working pipe with the least amount of material.

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One of them is now in the course of erection by the Aztec Gold and Silver Mining Company, at their mill in the Aztec District, Santa Rita mountains, Southern Arizona. At their office, 302 Montgomery Street, rooms 14 and 15, a model may be seen, and working drawings, with all further information necessary to enable any ordinary mason to construct the furnace, may be obtained from

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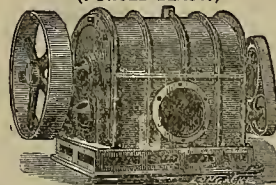
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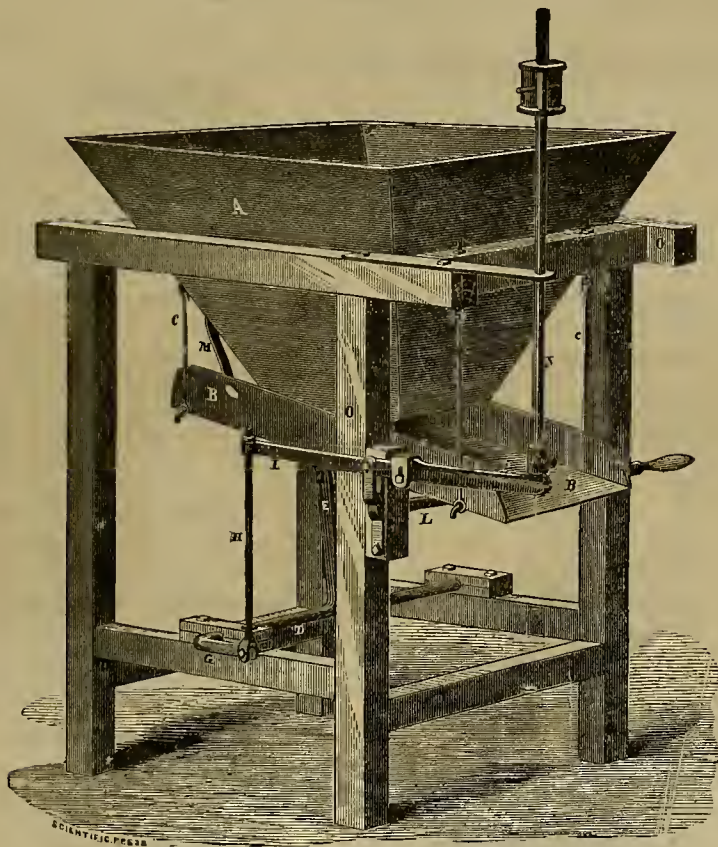
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Extract from a letter from C. G. Rodgers, Superintendent Green Mountain Mining Co., Plumas County, September 10th, 1877: After using both the Tulloch and Hendy Ore Feeders, side by side, for eight months, I can candidly say, that in my opinion, the Tulloch is much the best machine; it will feed any ore that can be fed by machinery; there is nothing about it to wear out, and should anything break, any blacksmith can repair it. Whereas, the Hendy machine is wearing from the moment it is started, and when any thing is worn out, or broken, you must have a machine shop or foundry to make the repairs. The Hendy Feeders are not in use at the Gold Stripe Mill; they were thrown out after a fair trial of some two weeks.

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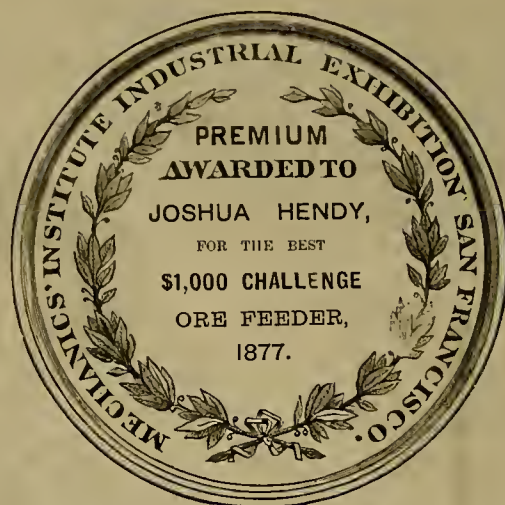
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As to my feeders having been thrown out of the Gold Stripe mill, they were not displaced for inefficiency, as the following letter will show, and it answers also as a complete refutation of Mr. Rodgers' statement:

OFFICE SUPERINTENDENT OF THE GOLD STRIPE G. M. CO., }

JOSHUA HENDY, Esq.—Dear Sir:—Your favor of the 15th instant at hand. In reply to your inquiry as to the working of your ore feeders at our mill, we can say that there is no fault in the machines, and we consider them the best now in use. At present they are not in use with us, owing to the construction of the mill, which we are about to rebuild and make proper arrangements for putting in your feeders.

J. K. OWEN,  
Superintendent Gold Stripe Mine.

One of the principal owners of the Gold Stripe and Green Mountain mills is also largely interested in the Plumas National mine, where I have just shipped several feeders, showing the confidence placed in the machine by these gentlemen who have used it.

Now, if Mr. Rodgers is sincere in his belief as to the merits of a rival machine over mine, here is a chance for him to make a thousand dollars easily, if he can get the owners of the machine to lend him one for the trial, which is the only doubtful point in connection with the matter. Mr. Rodgers' eight months' experience with both machines ought to give him confidence enough in his own convictions to accept the challenge offered to him, or any one else.

JOSHUA HENDY.

Corner Fremont and Market Streets, San Francisco.

It may be considered as now fully demonstrated, by careful and long-continued experimentation, that the plan upon which a perfect ore feeder must be constructed is that of the carrier, and not that of the shaking table. Uniform and accurate feeding is not possible upon the latter plan. The ore must be evenly carried, upon a steadily advancing plane or table, to the line of discharge, and there simply dropped. Spasmodic or jerky contrivances will not answer the purpose.

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California Company, Nevada County, Cal.  
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SAN LORENZO, December 6th, 1877.

MESSRS. DEWEY & Co.—Gentlemen: I received the Letters Patent for my invention on the 5th inst., and beg to thank you for the gentlemanly and business-like manner in which you have dealt with me from the beginning of my application. I shall always feel it a pleasure to recommend you to all I come in contact with who need Letters Patent. Respectfully,  
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# MINING AND SCIENTIFIC PRESS.

An Illustrated Journal of Mining, Popular Science and General News.

BY DEWEY & CO.,  
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## The New Year.

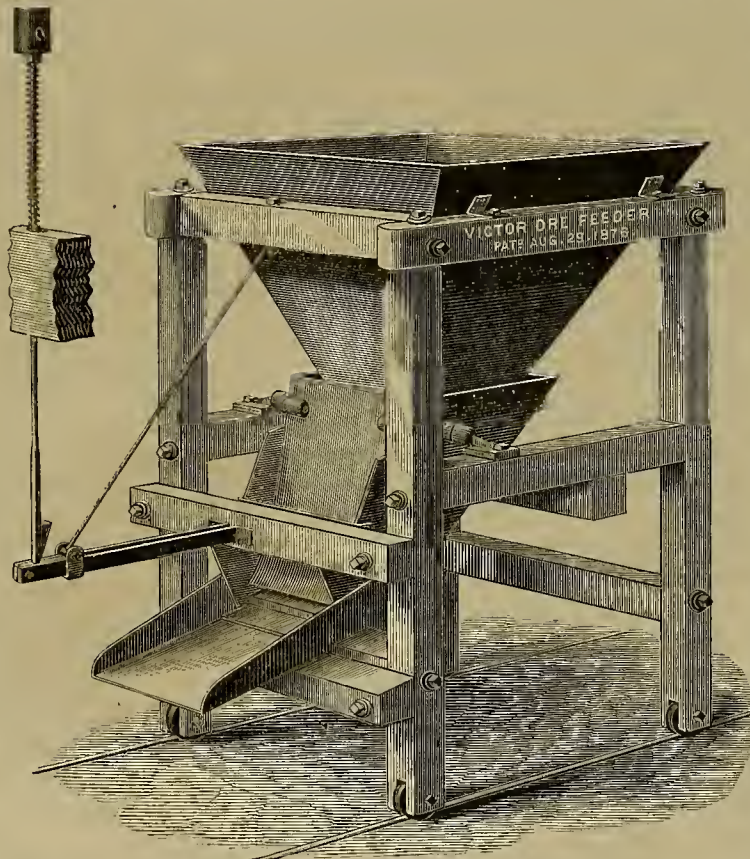
With bright face and strong heart the Californian greets the coming year. To many it comes as the breaking of a glad dawn to weary and despondent watchers. It promises a respite from enforced self-denial and deprivation. In the black storms, the moaning of winds from southward quarters and the copiously descending floods, hope has given birth to anticipation, and mouths of plenty seem assured. These are tokens of a revival of material prosperity, an awakening of trade, a confidence of investment, a fullness of production and all the dissemination of comforts which these carry in their train.

It is said that it is easy to do well in prosperous times, and, in prosperity's promise, similar case of well-doing may be enjoyed; by those, at least, who have hopeful hearts. It is also common to look upon the advent of the New Year as the season for salutary resolutions. Therefore the season is commended to all who feel strong within them the impulse toward better lives and more consistent actions. What though some resolutions fail of maintenance; what though some of the "new leaves," which are each year turned, fly back again to the heavier side of the volume. It is certainly better to resolve and fail than never to resolve at all. So far as these words apply to matters of personal actions and the methods of individual lives, we commend them to each of our readers for individual application.

In a wider circle, the old year teaches the imperative necessity which now exists, that all good citizens should arise to their duty in public affairs. Although we do not believe all that is said about the need of arraying one class against another for the general welfare of the State, and although we most abhor the ranting, roaring demagoguism which is rife, we are still well aware of the duty which the industrial classes owe to themselves in the issues which are now being made. It is true that the welfare of the many is too far given over to the hands of the few. This unfortunate condition of affairs extends from great things to small, and the and spirit of it is to secure personal aggrandizement, not by legitimate production and earnings, but by partial laws, by artifice and by fraud. The spirit is the same whether it operates by building up an oppressive monopoly under the guise of a national blessing; whether it creep into a legislature and frame a law which throws the burden of taxation where, in justice it does not belong; whether in the glitter of gilding, it builds a fraudulent bank, for whether, in the seclusion of a cellar, it grinds beans into coffee, mixes fine sand with garden seeds, or fills hutter firkins with tallow. All these public evils vary in degree but are the same in kind. They are all outrages upon the man who honestly labors and is privileged to demand protection from the State for his industry and its results. They all receive our unqualified hate and the full force of our journal is devoted to combatting them and aiding the people in bringing them to light and overthrow. As the New Year comes we resolve for ourselves, and we urge all our readers to similar resolution, to do all in our power to understand these wrongs and their remedies and to fearlessly declare them. We do not lose faith in human nature, no matter what evil is shown forth in the wicked plotting of a few; rather would we call out this manhood in which we trust to meet the vile schemes which are laid to oppress and defraud it. How can this be done? The remedy has been proposed a thousand times. Each citizen must rise to his duty to himself and to the State to see that he is not defrauded by the aid or through the negligence of those who represent him in law-making bodies. It is timely to make remarks like these. Our Legislature has just begun its session, and all should study the measures which are brought before it and should freely aid the people's representatives with their knowledge and suggestions on the special subjects which arise. These will doubtless be stirring and important and need the wisdom of all right-minded men for their true adjustment. Then will come the constitutional convention which will amend the organic instrument which will be the foundation of all

our laws. Let every honest vote be rightly placed in the selection of wise and upright men to discharge this most important public trust. Thus the coming year is charged with duties for each citizen of our State. For this reason we urge upon all our readers the resolution to arise to earnest, independent thought on public matters. This is the price of the success and perpetuity of our democratic institutions. Upon this depends the safety of our homes and the welfare of our children. Standing now upon the threshold of the year who will enter without resolving that the year shall not pass without his making every effort within his power for the attainment of the measures and safeguards which the public well-being demands.

That the coming year will be one of gratifying growth to our State and the coast in general; that in our homes, in a thousand hills and valleys there will be peace and prosperity; that



THE NEW VICTOR ORE FEEDER.

the delight of living in this favored land will be hallowed by the higher joy of living aright—all these we sincerely hope. And coming at last to the circle of our friends who extend their hands to receive the hearty greeting of the PRESS, our earnest wish is for A HAPPY NEW YEAR to each and all.

**THE MINE LOCOMOTIVE.**—EDITORS PRESS:—Among the articles in the MINING AND SCIENTIFIC PRESS which have excited interest here, is the one in your issue of December 15th, on "Mine Locomotives for Gold Mines." Several of your readers on the Comstock lode have expressed a desire to hear more on this subject, and also to learn more of the details of construction of the cars used, which desire you perhaps may be able to satisfy. Mr. Bowie's articles on hydraulic mining have been remarkably good.—H., Nevada, Dec., 1877. [We shall endeavor shortly to comply with the request of our correspondent.—EDS. PRESS.]

OVER \$8,000,000 was raised by 51 Bible, missionary and educational societies during the past year.

## The Victor Ore Feeder.

The accompanying engraving shows the Victor Ore Feeder, which is being introduced to the mining public by E. T. Steen, agent, 226 and 232 Beale street, in this city. It was patented through the MINING AND SCIENTIFIC PRESS Patent Agency, by J. Tulloch, in August of last year. The invention is the result of experience and experiment. The feed is positive and not by friction.

The Victor machine is so arranged that by the dropping of the stamp the ore is pushed forward as fast as required to supply the battery. The feed is regulated at the rear end by a simple device not shown in the engraving. This feeder is fitted with rollers for moving. It is

## Cheap Fares.

The fact that the Legislature has passed a law regulating the price of a single fare on the street railroads at five cents, is probably more important to the mass of the citizens of San Francisco than the question of choice of an United States Senator. Though apparently a small thing to grumble about, the six and a quarter cent fares, so long in vogue on the street railroads, has been burdensome. The railroad companies have been tenacious in keeping the fares at that figure, as it has given them considerable increase in revenue in more ways than are at first apparent. In the first place, of course, they only give four tickets for 25 cents, instead of five as they will have to do under the new law. But this has been perhaps of even less importance than the fact they got 10 cents for a single fare if coin were offered and change demanded, or if a 10-cent piece was paid instead of a ticket. Our system of coinage not admitting of taking six and a quarter cents from a quarter unless tickets were given instead of coin change, the passenger had to pay for a ride and a half instead of one ride when he handed the conductor a 10-cent piece.

We have, however, a five-cent piece, the smallest coin in use among us, and under the new law it will constitute a legal fare and the railroad companies cannot swindle the passengers out of three and three-quarter cents any longer. The only strange thing is that this swindle should have been tolerated so long as it has. A man would generally rather throw into the street a half dollar than to feel that he has been swindled out of three cents; and many persons have steadily refused to ride in the street cars on principle, rather than to submit to the extortion. Our street car lines are well patronized as it is, and ought to pay well without resorting to any petty extortions to increase their revenues.

To the humbler class of citizens residing in the suburbs, as most of our workmen do, this change to five-cent fares will be very welcome. It will not now matter to them whether they have tickets or coin when they get on a street car, as it costs them no more in either case, and we have no doubt that the measure will in the long run be to the benefit of the railroad companies as well as the passengers.

The old extravagant habits in vogue in the early days of California will not do any longer, and one by one the little impositions of companies and tradesmen, which have been so long submitted to, must give way to a changed style of living. The old 12½ cent and 6¼ cent swindles will soon be things of the past, although we still pay 15 cents for articles marked 12½ cents oftener than we ought to. The difficulty of making exact change is taken advantage of to charge 15 cents for things worth only 10 cents. For instance, the fare to Oakland on the ferries is the same as it has been for years, 15 cents, when 10 cents would be ample. Oakland, Alameda, Berkeley and vicinity now contain more than twice as many inhabitants as they did a few years since, and the travel by ferry has increased proportionately. The cost of operating the ferries is no more now than then, although the revenues must have been largely increased. Still, a single fare is 15 cents each way, although on Sundays in summer a ticket to go and return to Oakland is sold for 25 cents. When the price for single fare is reduced to 10 cents it will be very much better than now, for on Sundays and holidays our workmen delight to get a sight at grass and trees and breathe the fresh air on the bay, provided they can do so at a reasonable cost. We hope this change will soon occur and that before many years the fare will be even lower, so that it will cost no more to cross the bay than to go to the Mission.

A. H. STEPHENS, Chairman of the House committee on coinage, weight and measures, is at work on an exhaustive report, which he will make to the House soon after the holiday recess, in favor of making the metric system obligatory in all Government transactions.

JAMES HURLEY, a young man employed as carman in the Deer creek tunnel, Nevada City, was struck by falling rocks from the roof of the tunnel Tuesday morning, and received injuries which are likely to prove fatal.



## Trees and Rainfall.

No. 6.

[Written for the Press by SAMUEL PURNELL.]

## Why Trees Produce Rain.

The reader who has followed us thus far will have noticed that we have continually claimed that the destruction of the trees induces dryness and the planting of forests produces rain. The proof of both these statements is ample. As an example of the former it may be stated that 50 Communes of the French Alps are reported absolutely desolated in consequence of the felling of the forests. As an example of the latter, it is said that the rainfall in lower Egypt has increased from nine to sixteen inches because of the culture of trees. In South America when the forests surrounding the valley of Aragua were cleared the lake fell, and it rose when they were suffered to grow again. The Lake of Fuquene fell to one-fourth its former size when the neighboring mountains were stripped of their wood. The fact that trees do actually produce rain being unimpeachable, it may now be interesting to attempt to show why they do so.

A large part of the rain that falls upon a forest sooner or later percolates through the superficial strata, finds its way to the soil around the roots of the trees, and is conveyed to some distance by lateral infiltration. The soil of the forest being thus always moist, the water in great part is absorbed by the roots of the trees, and by the vital force is carried up the trunk, out into the small branches, and in thin layers is spread over the surfaces of the leaves. The leaves of a tree perform a service analogous to those performed by the lungs of a human being. The leafy lungs exhale and evaporate their moisture and discharge it into the atmosphere. This action is sustained as long as more water finds its way to the roots than the trees itself consumes. The amount of water so discharged into the air is not definitely known, and has been reported differently by several observers; but it seems probable that it amounts to at least one-third of the annual rainfall. In the course of a season a large tree will expose a couple of acres of foliage, and each leaf is busily at work as an evaporator. The dryer the surrounding air, the more readily does a wet-leaved tree breathe out its moisture. Grasses and shrubs, like trees, are also engaged in evaporation; and from the immense number of grass rootlets in a moist country, it is safe to assume that upon the whole they exhale as much moisture as the trees. It will be seen that an amount of moisture equal to one-third the annual rainfall being slowly and continuously introduced into the atmosphere must, in the case of larger forests, have an appreciable effect upon the increase of rain, for, if conditions are favorable, it will generally be reprecipitated in the vicinity of the trees that exhaled it, and give rise to local rains.

Trees also produce rain by keeping the ground beneath them shaded, moist and cool. Then as the moist winds blow over the ground they are cooled below the dew-point, and rain is precipitated. The temperature of the tree itself is about 54° F., is almost invariably below that of the summer winds and thus maintains a refrigerating and rain-producing influence.

The mere presence of a forest tends to mechanically produce rain by hindering the course of the winds and entangling the vapors. The small particles of moisture in the air are in a highly expanded and diffused state, and do not combine easily while they have free motion. By interrupting their course by trees the vapors are given a spiral and centripetal motion, causing the cohesion of the fine globules of vapor into a mass large enough to fall as a drop of rain.

Trees may be said to produce rain by still

## Another Method.

The electro-dynamic power of the sun causes moisture to rise from the oceans and saturate the surrounding atmosphere. The invisible watery vapors are in electric repulsion, and are driven asunder in consequence of being in a highly constrained electrostatic state. As long as this continues they cannot unite; their electrical tension must first be destroyed. In most cases the discharges necessary to accomplish this take place silently and invisibly, at other times with much noisy thunder and flashing lightning. In either case, the tension being neutralized, the vapors combine and the globules form drops of water which, other necessary conditions being present, will fall as rain. These reactions probably always take place during a rainfall. The electricity of the vapory cloud can only be discharged by coming in contact with a body charged with the opposite electricity; this may be another cloud, the surface of the earth or trees. Of all of these the latter is the most common and efficient discharger, especially during summer. The potential of a tree, to its topmost leaves, is at zero, and it is in the exact condition to neutralize the electricity of atmospheric aqueous vapor, and in this it performs the same service as a stroke of lightning, though the discharges are silent. The electricity of the cloud being discharged, the globules of vapor are at liberty to unite and finally cohere into drops of sufficient size and weight to fall to the ground as rain. That this is the actual order of events with most rain drops can scarcely be doubted. As before re-

marked, trees are not needed to secure at least a small amount of winter rains in California; the rain then falls from the warm and moist winds often by reason of mere refrigeration and disengagement of electricity; the vapors striking the cooler ground partially condense upon it, and, moistening the soil, a good conductor is formed at once for the neutralization of the electric waves, which action continues till the cloud is exhausted. This cannot be the case here in summer, for the naked soil is hotter than the ocean wind, the vapors are still more expanded upon passing over it, and the dry earth being an insulator, no precipitation can begin and no rain can fall. Reverse this condition; let a rain-cloud pass over a forest, its constrained electric condition will be destroyed, the repelled vapors will cohere and rain will fall in the vicinity. For the purpose of placing a zero potential in the atmosphere it is plain that a tree bearing a wet leaf and full of sap is preferable to one hearing a leaf comparatively dry or gummy; and is also preferable because its leaves remain cooler as it transpires more moisture. The eucalyptus, which is a favorite here on account of its rapid growth and reputed salubrity, is not as good a rain tree as some of the soft wood trees are, such as the beach, birch, pine and maple, the latter especially carrying much water.

Suppose the entire

## Mountains of the Coast Range

Were covered with forests of wet-leaved trees, we would be so fortunate as to secure summer rains from the trade wind. This wind blowing with an ocean current of low temperature, and possessing relatively but little humidity, instead of as now touching a coast much warmer than itself and having its relative humidity so lowered as to render it impossible to drop its moisture, would then impinge upon the cool mountain forests of the Coast range, its relative humidity would be raised, at favorable times its electricity would be discharged, its vapor particles assume the spiral and centripetal motion, its temperature fall below its dew point, and abundant summer rains would fall upon the coast and the interior valleys.

Did space permit, the writer would like to mention many cognate subjects, but this paper is already too long, and it would require a large volume to state the case fully. The interested reader can fill in the blanks himself; he will not lack for material.

## Among the Omitted Matters

Are statements of the waste and destruction of timber upon the Coast range and the Sierras; the recovery of Nevada, western Arizona, and the Colorado and Mohave deserts; the laws of some of the nations of Asia and Europe upon the preservation and cultivation of trees; the increased productivity of the State, consequent upon summer rains, and its increased beauty and healthfulness; the probability of development of a nobler type of man; the absolute impossibility of any considerable area being irrigated, and the time and cost of general irrigation, being insuperable difficulties in the way of the same; the uncertainty of flow and the expense of artesian wells; the use of grass in nature, and its relation to trees and rain; the solvent power of living roots, and their value as tie to prevent erosion; the cause of hail storms and how forests prevent them; why California contains so few wild birds; why the prairie States were devastated by locusts or grasshoppers, and the relation of that scourge to trees and rain; the proper proportion of forest to cleared land, showing that while in Europe generally and the Atlantic States 25% of woodland is ample, France requires one-third of her area in forests, and California requires at least two-thirds of her coast wooded, and half of the Sierras and the valleys; the progress made in France, Germany, Austria, Russia and Egypt in silviculture, and the increasing success of the efforts; the superiority of cultivated timber to that of spontaneous growth; the proper measures to be taken to direct public sentiment to tree planting, to make it to the interest of landed proprietors to maintain forests; the annual income of forests; the chemical work of a forest, the effect of ozonized oxygen, and the protection offered against malaria, cholera, and infectious diseases; the hygroscopicity of naked and of wooded soil; the influence of forests in checking storms, preventing frosts and cold and hot winds, such as the mistral, the terrible wind of France and the desiccating north wind of California; the growth and march of dunes, owing their destructive character to the ravages and improvidence of man; the hypothesis of a rising or falling coast, as regards a geological horizon, and its influence upon rainfall; why Indian corn and many other staple crops do not succeed well in California; why irrigating water does not stimulate and fertilize plants as much as falling rain; the proximity of most of the aqueous vapor in the air to the surface of the earth; the physical record of Mexico and Central America; the telluric forces now at work upon the Pacific coast. These are all interesting subjects, and may be fully presented at some future time, should there be any demand for such information.

## To Conclude

This series of articles it now only remains to say that as the scattered trees and remnants of forests are fast disappearing before the spoiler, and no forest trees are cultivated; as things are now progressing in California, in consequence of false ideas of the rights of property, the selfishness of the people, and the want of a correct public sentiment upon the subject of forests, the State must naturally and slowly become

drier and drier, the mountains more desolate and rugged, and the interior valleys more and more unfruitful and uninhabitable, till at last they shall in, sterility equal the great desert of Sahara, and the dwellers thereon meet the fate of the Aztecs and Mound Builders. Behold the approach of the desert, the crime against posterity! Would you avoid it? The present destructive course of nature can he reversed, summer rains made to fall, and the entire State be thus converted into an ever-fruitful and enchanting garden of health, happiness and plenty, simply and only by the universal planting and maintenance of TREES.

## Garland's Mine and Mill.

The editor of the Calaveras Chronicle recently made a visit to Garland's mine and mill in this county, and says: The mine is located in Tunnel ridge, about two and a half miles from Mokelumne Hill, on the Chible Gulch road. It comprises the ground embraced in the two locations formerly known as the Carpenter & Bailey and Green & Guy claims, having a front of over 1,000 feet and extending through the ridge. A great deal of money was taken out of the two claims mentioned by their former owners, the only drawback to the complete success of their working being the extreme hardness of the ground. The gravel is streaked with a species of cement that is so tenacious that the ordinary process of washing fails to extract the gold, and in some instances blasting has to be resorted to in mining the dirt. A tunnel 450 feet in length has been run since Mr. Garland purchased the ground, and it is still being extended. The face of the drift is yet in good looking gravel, showing that the channel or "pay streak" is a wide and extensive one. The tunnel is substantially timbered throughout, and is traversed by a line of railroad that does a lively business in the way of delivering gravel at the mill, returning with the timbers and other etc. required in the prosecution of extensive mining operations. Three "breasts" have been opened off the main tunnel, looking up the ridge, which will give abundant opportunity for the mining of gravel fast enough to keep the mill in constant operation. The gravel looks and prospects well, the mine, is opened in splendid shape for working to advantage and all the indications point to a permanently profitable enterprise.

The mill, a five-stamp battery, is a model of neatness, compactness and substantiality. Water is the motor. It is supplied by a 11-inch iron pipe, under a pressure of 250 feet, the power being applied through the medium of a hurdy-gurdy wheel of the latest and most approved pattern. The battery is so arranged that five additional stamps can be put on whenever required, the shafting being heavy enough and the power abundant to admit of doubling the present crushing capacity if desired. The mill is furnished with Cochran's patent cans and self-feeders, and in fact all its appointments are first-class, no expense having been spared in providing everything that can facilitate operations. Ninety tons of cement are put under the stamps in 24 hours, but 15 inches of water being required to run the mill.

Connected with the mine are a large boarding house, blacksmith shop, etc., and as a number of neat cottages have been built in the vicinity for the accommodation of miners with families, the place presents the appearance of a new and thrifty settlement. Twenty-five hands will find employment just as soon as development enough is made to admit of the working of a full force.

E. Jillson, Esq., an experienced mine and mill-man, is general superintendent of the enterprise, Mr. Richard Evans officiating as underground foreman. The mill was built under the supervision of Mr. John Rider, a mechanic whose work never fails to give satisfaction. Mr. Garland deserves success for his energy and perseverance in pushing forward an enterprise that involves some risk and a large expenditure, and we are glad to be able to say that the prospects of the mine are certainly extremely favorable.

## Turkey Creek, Arizona.

The Arizona Miner says: Mr. Masterson, the owner of the new mill that is now completed, which will commence operations this week, arrived in town on Monday. We learn from him that steam has been raised, and the whistle sounded, the stamps dropped, and all the machinery moved, clearly demonstrating that everything is complete about the concern to commence operations in earnest this week. Numerous valuable leads grace the hills surrounding this new ore reducer, and many tons of rich chlorides lay heaped upon the dumps at the various lodes, which will now be moved in and consigned to the pulverizing giants that have been placed in the rugged sierra by this enterprising gentleman. This mill, although of small capacity, is complete and substantial in every detail, and we imagine just what most of quartz kings need, for should it become necessary, as is many times the case, to remove the machinery to another location, it can much more readily be handled, and a small cost will cover the taking down, removing and re-erecting of the same, while the capacity is sufficient to satisfy the demands made upon most quartz mills, if kept running steadily, which is the intention of Mr. Masterson with his little Gem, that now stands in princely majesty, surrounded by a grand old forest, beneath whose earth lie

hidden the sparkling stones containing gold and silver.

The machinery is all from the Pacific iron works, San Francisco, and is of the latest and most improved pattern, and so accurately arranged and fitted that when the mechanics who superintended the erection of the mill pronounced the work finished, the stamps were dropped and the machinery put in motion, everything worked like a charm. The mill has a capacity of four tons per day, has a No. 60 screen, and each stamp weighs 850 pounds, the battery weighing one ton; the engine is of 25-horse power, and the battery is so arranged that in case the demands upon the mill from the many mines adjacent require a greater capacity, more stamps can be added with but little expense and trouble. It is claimed for this machinery that it is as durable and of as fine a finish as any that ever left the city of San Francisco, and is intended as a specimen whereby the hundreds of miners who own extensive mining interests may examine its merits, and if it accomplishes one-half what it is claimed it will, we doubt not but what hundreds of these bullion-producing agencies would be purchased and erected all over the mountains, as they are within the reach of every man who has a few tons of good ore. This little mill, with its formidable proportions, may be the means of causing a great revolution in the mining camps all over Arizona. The brick work for the boiler and other parts of the building was managed in a very satisfactory manner by Messrs. Longbottom & Joyner, the material being of a substantial character.

## The Mines of Como.

Now that capitalists are meeting with such excellent success, says the Enterprise, in the old and almost abandoned mining districts of Aurora and Bodie, we would suggest to them that we have a dead camp much nearer home that might pay well for revivification. This is the old Palmyra or Como mining district, in the first high range of mountains southeast of the town of Dayton.

The mines of that district were once highly valued and there was no little excitement in regard to them. The town of Como, situated in the midst of the mines, once boasted its church, schoolhouse, brewery and newspaper and promised to become a permanent and prosperous place, but hard times came on, prospecting ceased, the town went into the sere and yellow leaf and finally died, deserted by all its friends.

All the principal ledges of the district prospect well in gold and silver, particularly the latter, in the very croppings. Black sulphure of silver is to be seen in pieces of rock broken out of ledges at points above the surface, and, this being the case, it would seem that there should be something good somewhere below if properly sought for.

The shafts sunk there would here be called nothing more than a "starter," being but 100 or 200 feet in depth; yet when they had gone to that distance below the surface, the old time prospectors became discouraged because they did not cut into big deposits of the richest black sulphure ores.

The several rich veins cropping out on the surface are probably but the feeders of one grand lode, and it would doubtless be worth while for some good miner to take a look at the range in this light and with a view to sinking a proper shaft in such a position as would open up the mother vein.

In the early days, wherever a streak of quartz—a feeder—came to the surface, it was looked upon as being a lead by itself and was located and worked as such. Therefore, we find that there was a great number of holes, called shafts, sunk on these spurs and feeders, and thus the miners frittered away their time and money until the latter was no more and their patience was exhausted. They scratched over a great deal of surface, leaving the real vein untouched.

These feeders they located as so many distinct lodes, and each man or company dug away until starved out, none getting deeper than 200 feet below the surface. Directly through the old town of Como, as we may say, run feeders that were formerly known as the Aurora, Montezuma, Altamonte, Wagram, Goliath, Buckeye, Monte Cristo, Rappahannock, Orizaba and Rapidan mines, with half a dozen more that might be named. All the veins or feeders named above showed silver from the start and none of them were sunk upon to any depth worth naming; indeed, when more water came in than the miners could bail out with a windlass and bucket, they threw up the sponge.

The sulphurets in the croppings are of a very fine grain and should be very carefully worked; the pulp should most probably be treated much as we now treat slimes. For this reason the rock was not made to pay in the old-fashioned mills and by the rude processes in use in early days, even when excellent assays were obtained.

These old Como mines are certainly worth being looked after, and, viewed in the light that we have on mining at the present time, we have no doubt a shaft might be so located as to develop a grand main lode, running beneath and a little to the eastward of the principal veins and spurs sunk upon in the early days. The old Whitman, to the northward of the town of Como, is the largest of the veins seen on the surface and would probably be a good indication of the whereabouts of the mother lode of the district. It is a vein that prospects well in silver from the top down.



## MECHANICAL PROGRESS.

## Conversion of Steel.

Some weeks since we gave the method by which blister steel is manufactured. As we find these notes on the metals they use are quite acceptable to our readers in the machine shops, we give another paragraph on the conversion of blister steel into shear steel and cast steel. This subject was recently discussed by Mr. J. G. Fairweather before the Scotch Society of Mechanical Engineers, and we draw from his lecture the following descriptions:

In the conversion of blistered steel into tilted or shear steel several bars of blistered steel are bound together into a bundle which is raised to a welding heat in a forge and placed under the tilt-hammer. A few blows soon weld the bars together, when the hindling ring is knocked off, the bundle reheated in the forge and hammered until it is reduced to a rectangular bar of the required dimensions. Shear steel possesses a much more compact structure than the blister steel, and its tenacity and ductility have been much improved by the tilting. If double shear steel be required, the tilted bar is broken, and the two pieces welded into a single bar. Shear steel is commonly employed for tools, which are to possess considerable toughness without being extremely hard; but its deficient hardness prevents it from taking a very high polish or a very keen edge, so that it will not serve for making the finest qualities of cutlery. The best variety of steel used for these is made by melting the blister steel and casting it into ingots.

In the conversion of blister steel into cast steel, the blister steel is broken up into pieces of a convenient size for packing close together and about 30 pounds or more of it are introduced into a crucible about two feet high, made of fire clay mixed with black lead, and provided with a closely-fitting cover. Hard coke broken, into small pieces is employed for heating the crucibles; the steel is then introduced, the crucibles covered and the furnace filled up with coke. When the steel is melted, the crucible is withdrawn, and its contents poured into a rectangular or octagonal mold of cast iron, which has been previously heated and placed in a vertical position. The fusion of the materials in crucibles is the simplest and oldest mode of making steel, and it has been practiced by the Hindoos from a very remote period. In this process a small quantity of wrought iron, from one-half to two pounds either in one lump or cut into pieces, is charged into a crucible of baked clay along with 10% of dried wood, and luted over. When the luting is dry, a dozen or two of these crucibles are stacked together in the form of a dome; a fire is lighted inside of this dome, and the interstices filled with charcoal, which is also heaped over the top. The fire is urged by bellows, and in from 2½ to 4 hours the operation is completed. A new arch of crucibles is then constructed, and so the process goes on night and day. The resulting steel, called "wootz," is obtained on breaking open the crucibles, as melted cakes; which are reheated for several hours to a temperature slightly below their fusing point. They are afterwards drawn out under the hammer at a very low red heat, as the metal crumbles to pieces if an attempt is made to forge it at a high temperature.

**PROFIT LIES IN THE SHOP.**—Some years ago, says the *Railroad Gazette*, when building locomotives was a very profitable business, a gentleman who had acquired his training almost entirely in the commercial school abandoned his early occupation and embarked in the one referred to, which then promised to be more lucrative than his old business. True to the instincts and traditions of his early calling, the first thing he did was to open an elaborate system of accounts, so as to keep a correct record of the cost of everything and the receipts and disbursements of the business. Soon after being launched in his new career, another gentleman, who had had a number of years' experience in building locomotives, called on his new professional brother, who took some pains to show his visitor how skillfully he had organized his system of accounts, and dilated at considerable length on the fact that his prospects of doing a profitable business were good, because, he said, he would know exactly what everything would cost. "Well," his visitor replied, "if you can make money in the locomotive business by skillful book-keeping in your office, you will be doing what no one ever succeeded in doing before. If you make money," he continued, "you must make it in the shop, not in the office."

**THE GREAT STEAM HAMMER AT CREUSOT.**—The largest of the steam hammers at Creusot is something of a curiosity. It is formed of two cast-iron jacks each consisting of two parts, bolted together, and inclined to each other like the letter A. These jacks support the entablature which carries the steam cylinder, and are joined by broad plates of forged iron. The anvil is formed of 11 layers of cast-iron, planed and keyed together with special I-shaped pieces. The bed of masonry is 20 feet deep, and between the ground and the anvil are placed crossed planks, horizontal and vertical, to form a kind of elastic packing for it. The bed contains 100 cubic meters of cast-iron, 100 cubic

meters of wood and 1,000 cubic meters of masonry. Four gas furnaces and four cranes, three carrying 100 tons and one 150 tons, are in the service of the hammer, the cranes themselves carrying their own engines. The hammer, furnace and cranes are placed in a special shop built of iron. The hammer, which will have a useful effect up to 80 tons, will forge steel ingots of a weight of 100 or 120 tons, and it has been necessary to construct powerful tools for the manipulation of these masses of metal. The great hammer at Krupp's works at Essen is capable of dealing only with ingots of from 45 to 50 tons in weight.

**EUROPEAN OPINION OF AMERICAN SKILL.**—Prof. Reuleaux, of Berlin, who the *Iron Age* says generally regarded as the first of mechanical engineers in this country, if not in Europe, and a man of broad accomplishments and excellent judgment in other branches of industry and art, has just published in book form a series of letters upon the industrial position of the United States, written during a visit to the Centennial exposition last year, in which he says the wealth of our country in coal and iron is such as Europe furnishes no parallel for. In regard to machinery, it is frankly admitted that the United States has begun to occupy "one of the places in the first rank, in some respects the very first." In tool making, especially they "carry away the palm, not only at the exhibition, but seemingly everywhere." To this complimentary summing up Prof. Reuleaux joins an enumeration of the specific excellences which distinguishes American tools, which have got far beyond German products in this line, and have even "hurled the English out of the saddle." In this connection particular reference is made to American weaving machines, machines for working in wood, labor-saving machines of all sorts, and especially to printing presses. Of our future development in industry and art, he maintains that there can be no doubt, because we have education, great mechanical skill, know how to use machinery to advantage, and have natural resources far superior to anything known in Europe.

**RAILWAY SHOVELS.**—W. S. Huntington writing for the *Railway Gazette* says that a shovel may be considered by some as a tool too insignificant to be worthy of mention, but there is no implement in use in engineering work that outranks that simple and much abused tool in usefulness. And a shovel, like any other tool, should be of a kind adapted to the work it is to do. A light thin-bladed steel shovel may answer a good purpose in the molder's room of a foundry, but it is next to useless for railroad work; and yet we have hundreds of miles of road literally strewn with broken shovels, many of them not lasting to do a single day's work, when they break and are thrown aside, and very likely another of the same worthless kind is taken in hand, to soon follow it against the fence, into the ditch, or into a pile behind the tool-house. It is a waste of money to buy the thin-bladed, hard steel shovels with the straps riveted to the blade; they are dear at any price and are not intended for railroad work. The standard shovel for railroad work is known as No. 2, cast steel, and they will last until worn out; they never break. For many years a New England manufacturer supplied the demand for these shovels, but others are now producing those said to be equally as good. There is nothing gained in getting an inferior article of tools because they are cheap, for in reality they are the most expensive, and a poor road cannot afford them.

**EMERY BOARD.**—Emery paper is considerably employed for cleaning and polishing metals, but all the kinds in use hitherto have the great disadvantage of not retaining an equal efficiency. The fresh parts bite too much, and the paper itself soon gets worn through in places. Emery on linen has been tried, but without much success. The emery paper recommended herewith is not a pasteboard with emery on both sides, but a board in which emery enters as a constituent part. Fine and uniform card-board pulp must be procured, and from one-half to one-third its weight of emery powder thoroughly mixed with it, so that the emery may be equally distributed. The mass is then poured out into cakes of from one to ten inches in thickness. They must not be pressed hard, however, but allowed to retain a medium pliability. This paper will adapt itself to the forms of the articles, and will serve until completely worn out.

**GERMAN ALLOYS FOR COCKS.**—It will be of interest to Americans engaged in the production of brass cocks and the like to know something about what is considered in Germany good practice in the use of alloys. After a long discussion, the Society of Mechanical Engineers of Vienna have decided upon the following alloys as best suited for cocks and valves for machinery:

	No. 1	No. 2	No. 3
Copper.....	84	83	80
Tin.....	22.9	17	18
Zinc.....	8.4	..	2
Lead.....	4.3	..	..
Iron.....	..	..	..
Total.....	100	100	100

They believe that objects just cast, and still red hot, may be improved much in quality by rapidly cooling with water. The grain becomes finer, and the alloy acquires a greater tenacity and hardness. Especially alloy No. 2 seems to be favorably affected by this operation.

## SCIENTIFIC PROGRESS.

## Air and Altitude.

A memoir on the temperature and humidity of the air at different hours, by Dr. H. E. Hamberg, based on observations made by him during the summer of 1875, at heights varying from two inches to 22 feet above the ground, was published recently in the transactions of the Royal Society of Sciences at Upsal. The memoir is summarized in *Nature*, and is a valuable one, and is of interest to more than the mere meteorologist, it being evident that the inquiry is so handled as to bring it into close connection with such difficult questions as connection currents in the free atmosphere and the diffusion of vapor through the air.

In clear weather the temperature of the air nearest the surface was lower than that above it from two to three hours before sunset to at least two to three hours after sunrise. At all the six heights the temperature fell to the minimum at the same hour—viz., about 3 A. M.; but while it continued from this time to rise steadily at all the heights, the lowest temperature continued to be observed in the strata nearest the ground till several hours after sunrise. From this remarkable result Dr. Hamberg concludes that the increase of temperature in the lower strata of the air in the early part of the forenoon is not an immediate and direct consequence of the heating of the ground, but is rather to be attributed to absorption by the air, or, more strictly, by its aqueous vapor, of the heat received from the sun's rays or reflected from the ground.

Over uneven ground covered with vegetation the temperature is generally higher over those parts of the field which rise above the general level. Thus even slight elevations of only one or two feet have the air immediately resting on them often two degrees higher or more, whilst, on the other hand, a trench or depression one or two feet below the general level has the air resting on it two degrees or more lower than the air over the level portion of the field, a result of considerable practical importance in agriculture and horticulture.

The latent heat set free on the formation of dew appears from the observations clearly to retard the lowering of the temperature, but not to the extent which might have been expected. When, on the deposition of dew, the temperature of the air near the surface has fallen below 32°, as soon as the dew is congealed into hoar frost, the temperature of the lower stratum of the air in contact with the ground instantly rises to 32°; but at the same time the temperature of the air higher up steadily remains lower than 32°.

The absolute humidity of the air on clear nights, on which no dew is deposited, decreases from the ground upward, just as happens during the day; but, on the other hand, with dew the humidity is least nearest the ground, and increases with the height, and this influence of dew, in diminishing the humidity, extends upward to at least 22 feet, the height to which the observations were carried. Since his observations clearly show that the absolute humidity begins in the evening to diminish near the ground, before any dew is observed to be deposited, and also diminishes at all heights on those nights during which no dew whatever is formed, Dr. Hamberg is of opinion that the diminution of the humidity of the air during night is to be sought for in other physical causes than the deposition of dew.

**AMERICAN CONTRIBUTIONS TO SCIENCE.**—At the anniversary meeting of the Royal Society, Nov. 30th, the President, Sir Joseph Hooker, after a detailed examination of recent scientific investigations in America, said: "I must not close my notices of some of the labors of our scientific brethren in the United States without expressing my admiration of the spirit and manner in which the Government and people have co-operated in making known the physical and biological features of their country, and my conviction that the results which they have given to the world are—whether by magnitude or importance—greater of their kind than have been accomplished within the same time by any people or government in older continents. How great would now be our knowledge of the climate and natural features of India had its trigonometrical or revenue surveys been carried out in the same catholic spirit; and what scientific literature can England and her colonies show to compare with that of United States surveys?"

**VITALITY OF SEEDS.**—Van Tieghem contributes a paper to *L'Annuaire des Sciences Naturelles* on the reason why some seeds retain vitality longer than others. It is a question wholly of the condition of the albumen. In certain oily seeds the albumen changes its character before the plant is ready to germinate, and then the sprouting plant feeds on just what it finds, and which may or may not be nutritious; but in other cases the plant feeds directly on the albuminous matter, or, in other words, on its endosperm. There are some plants which have no albumen, and these are so constituted that they can get their nourishment directly from the soil. In old albuminous seeds that fail to show the reason is that the albumen has all or nearly all been chemically changed, and there is nothing left to give the little germ support till it is able to take care of itself. Why ex-albuminous seeds perish is not made clear.

**THE METRIC SYSTEM.**—Nearly every other nation of Europe having led the way Russia is about adopting the metric weights and measures. The special committee which is sitting at St. Petersburg, at the headquarters of the Russian Imperial Technical Society, have not only come to the conclusion that such an innovation would be useful, but have also emphatically declared that the present is the fitting moment for the introduction of the metric system. They think that the change ought to be accomplished within two years. It is a remarkable fact that Americans, with all their boasted readiness to adopt labor-saving inventions, and having led the world in use of a decimal currency, should be one of the very last nations of the globe to adopt what John Quincy Adams, in his official report, pronounces the greatest invention of human ingenuity since that of printing, and a greater labor-saver than steam. Certain persons have strenuously urged that the adoption of the international weights and measures would be a source of great inconvenience and expense to the machinists and manufacturers. The advocates of the system, having made inquiries of machinists and manufacturers in various countries of Europe, reply that the objection is one of theory and not of fact, as those who have actually tried the experiment testify. As the old machinery wore out it was replaced with the new, and a little time being taken the greatly dreaded confusion and expense were largely obviated.

**BODY AND MIND.**—Some points in the relation of the mind to the body are touched upon in a suggestive way by Prof. Nageli, of Munich, in his recent lecture on the "Limits of Natural Knowledge," delivered at the Munich meeting of the German Scientific Association, and which supplements the recent utterances of Virchow and Haeckel. "The human mind," he says, "is nothing else but the highest development upon our earth of the mental phenomena which move and animate nature everywhere. But it is not the product of secretion of the cerebral substance. As such it would be without further influence upon the brain, just as the secreted gall is of no further significance for the liver. On the contrary, sensation and consciousness have their firm seat in the brain, with which they are indissolubly united and in which, by their intervention, new conceptions are formed and converted into actions. Just as the stone would not fall down if it did not feel the presence of the earth, so the trampled worm would not wriggle if it had no sensation, and the brain would not act reasonably if it had no consciousness."

**PARSNIP PECULIARITIES.**—At the recent meeting of the French Association for the Advancement of Science, M. Corenwinder, who has long been engaged in researches upon the various alimentary roots, brought up a report on his investigations on the composition of parsnips, with which he has been chiefly occupied during the current year. He gives the chemical composition of the root as follows:

Water.....	79.450
Nitrogenous substances.....	2.303
Cellulose, pectose, etc.....	11.197
Crystallizable sugar.....	4.570
Glucose.....	0.320
Starch.....	1.075
Mineral matter.....	1.925
Total.....	100.000

From this analysis it appears that the parsnips contain an amount of crystallizable sugar by no means to be despised, especially as the root never gets frozen, and can be allowed to remain in the ground until wanted, even in the severest winters. The proportion of phosphates is abundant, and that of the potash salts collectively actually enormous, which facts should encourage a far more general cultivation of this vegetable. With regard to the amount of nitrogenous matter present, M. Corenwinder finds that it is far larger in the parsnip than in any other of the various roots he has analyzed.

**NEW FOSSILS FROM THE ALEUTIAN ISLANDS.**—At a recent meeting of the California Geological Society, carboniferous fossils were exhibited from the Aleutian islands, where they were associated with coal. The fossils were referred to Mr. S. A. Miller, of Cincinnati, a well-known paleontologist, for examination, from whom the following letter was received: "The fossils from Sitka came duly to hand. The *Productus* is, so far as I am able to determine, a new species. It forms it resembles *P. horridus* of the Permian group in Europe, the surface lining alone distinguishing it. *Productus horridus* has a deep mesial depression and fine concentric markings. This species has the deep mesial depression, fine longitudinal lines, without concentric markings. I would not hesitate to describe it if a figure could accompany the description, but I am opposed to describing a fossil without illustrating the description. If our Society of Natural History does as I expect it to do soon, I may be able to publish with proper figures. I would like, however, to have the other valve, though it is not essential. As the genus *Productus* is unknown later than the Permian, you can be assured that this fossil is of carboniferous age."

**IMBEDDED ACORNS.**—The St. Helena *Star* says: John Gillam informs us that in getting out grape sticks at his place up the valley, he lately cut a redwood tree, seven feet through and 250 feet long, in which, at a distance of 18 inches from the exterior, he found deposits of acorns, evidently stored by birds long ago and grown in by a foot and a half of solid wood.



## Table of Highest and Lowest Sales in S. F. Stock Exchange.

Name of Company.	Week Ending Dec. 6.	Week Ending Dec. 13.	Week Ending Dec. 20.	Week Ending Dec. 27.
Alpha.	16 123	147 133	143 133	13 13
Alta.	21 181	19 195	223 171	22 21
Andes.	1.05 606	1.35 900	1.20 1 11	1 11
Baltimore Con.	1.40 31	71 61	71 51	51
Belcher.	80 40	75 61	75 60	60 30
Best & Belcher.	234 21	22 20	22 20	21 20
Bullion.	9 4	61 61	4 4	4 4
California.	294 28	294 28	294 28	274
Challenge.	11 1.40	11 1 11	11 1 11	11 1
Chollar-Potosi.	49 40	46 40	43 40	40 36
Confidence.	7 7	7 7	7 7	7 7
Con Imperial.	11 1.05	1.30 1.05	1.20 1.05	1 11
Con Virginia.	24 23	24 23	24 23	23 23
Crown Point.	91 61	9 71	81 7 71	7 71
Cose Con.	50 50	50 50	50 50	50 50
Grand Prize.	36 34	38 37	39 36	36 35
Exchequer.	6 43	5 44	5 45	4 45
Geddes & Bertrand.	56 56	56 56	56 56	56 56
Gen Thomas.	130 121	123 112	112 112	112 112
Grand Prize.	1.80 1.40	1.60 1.40	1 1.40	1 1
Globe Con.	1.40 956	1.15 91	1.15 91	1.15 91
Golden Chariot.	12 91	11 91	11 91	11 91
Gould & Curry.	138 91	111 101	111 101	111 91
Hale & Norcross.	256 206	300 256	256 206	256 206
Hussey.	2.60 31	10 21	2.90 2.55	2 25
Julia.	152 121	15 13	3 31	11 10
Justice.	2 3	2 3	2 3	2 3
Kentuck.	3 5	61 51	5 5	5 5
Knickerbocker.	30 25	30 25	30 25	25 25
Kosuth.	11 9	12 11	10 13	11 11
Lady Wash.	11 1.10	11 1.10	11 1.10	11 1.10
Leviathan.	75 50	40 50	55 40	40 35
Leeds.	50 40	50 40	3 35	80 80
Manhattan.	12 11	11 11	11 11	11 11
Mansfield.	25 50	50 40	50 40	50 40
Meadow Valley.	11 15	14 17	14 17	14 17
Mexican.	14 95	11 1 11	1 85	1 90
North Con Virginia.	21 1.25	1.63 2.1	2.05 2.45	2 10
Niagara.	14 11	11 12	11 12	12 12
Northern Belle.	85 65	50 90	2 11	2 11
Occidental.	1 1	1 1	1 1	1 1
Ophir.	54 45	51 46	56 49	56 52
Overman.	254 22	26 24	24 24	24 24
Phil Sheridan.	60 60	40 50	40 50	40 50
Panther.	60 60	40 50	40 50	40 50
Poorman.	60 60	40 50	40 50	40 50
Prospect.	81 71	81 81	81 81	81 81
Raymond & Ely.	25 20	25 20	25 20	20 20
Rock Island.	14 11	13 12	14 12	14 11
Sage.	50 40	46 43	39 35	39 35
Seg Belcher.	60 40	46 43	39 35	39 35
Sierra Nevada.	60 40	46 43	39 35	39 35
Silver Hill.	21 8.90	21 3.30	2.60 3.50	2.80
South Chariot.	58 21	32 3.05	32 3.40	32 31
Succor.	1.40 1.20	11 85	1.10 90	95 90
Trojan.	13 71	13 71	13 71	14 14
Union.	13 71	13 71	13 71	14 14
Wells Fargo.	40 30	55 25	40 30	20 20
Woodville.	1.10 1.60	3 1.60	2.70 1.55	55 55
Yellow Jacket.	13 12	12 11	12 11	10 10

## Sales at S. F. Stock Exchange.

Friday A. M. Dec. 21.	135 Overman.	241 241
10 Alpha.	135	6 67
175 Alta.	21 621	621 30
33 Andes.	1.15 1.20	230 140
25 American Flat.	11 2650	30 35
10 Best & Belcher.	20 21	30 35
30 Belcher.	50 50	71 71
400 Bullion.	640 640	30 30
1260 Benton.	310 310	11 11
300 Boyle.	95 95	11 11
160 Chollar.	40 40	12 12
530 California.	23 23	1.00 1.20
425 Con Virginia.	210 210	1.00 1.20
540 Crown Point.	7 7	3 3
1580 Con Imperial.	1.05 1.01	20 20
550 Caledonia.	4.60 4.51	15 15
50 Challenge.	11 25	10 10
100 Dayton.	44 5	66 66
800 Dancy.	40 40	10 10
220 Exchequer.	4 1360	4 63
715 Gould & Curry.	10 10	35 35
10 Hale & Norcross.	10 10	35 35
1440 Justice.	10 10	40 40
350 Julia.	2 55	28 28
140 Kentuck.	54 55	22 22
40 Kosuth.	25 25	40 40
870 Lady Wash.	620 620	40 40
250 Leviathan.	40 40	50 50
900 Lee.	1 35	1.05 1.01
1565 Mexican.	15 15	4.55 4.41
1260 Monumental.	15 15	30 30
200 Morning Star.	60 60	14 14
200 Mint.	20 20	55 55
650 North Con Vir.	35 35	50 50
1225 New York.	24 24	35 35
120 Ophir.	120 120	14 14
80 Overman.	24 24	1.40 1.60
230 Occidental.	2 2	10 10
600 Patten.	55 55	10 10
400 Rock Island.	25 25	11 11
100 Succor.	30 30	11 11
375 Savage.	13 13	11 11
650 Sierra Nevada.	51 51	25 25
20 Seg Belcher.	35 35	85 85
1240 Silver Hill.	120 120	23 23
3700 Solid Silver.	6 6	40 40
500 Senator.	40 40	31 31
2030 St Louis.	40 40	1 20
800 Trojan.	30 30	1.95 1.95
280 Union.	7 7	2 60
145 Utah.	10 10	2 60
75 Ward.	60 60	40 40
890 Woodville.	1.55 1.50	12 12
670 Yellow Jacket.	11 11	16 16
AFTERNOON SESSION.		
1685 Alta.	21 21	50 50
220 Alns.	91 91	150 150
1100 Argenta.	1.40 1.40	80 80
60 Best & Belcher.	2 2	80 80
770 Bodie.	2.45 2.21	2.40 2.45
200 Bullion.	70 70	141 141
110 Belmont.	60 60	100 100
250 Benton.	3 65	59 59
30 Belcher.	120 120	20 20
60 Con Virginia.	22 22	25 25
225 Caledonia.	4.60 4.45	20 20
50 Chollar.	2 2	71 71
1520 Day.	60 60	35 35
1520 DeFrees.	60 60	35 35
450 Eureka Con.	35 35	36 36
140 Exchequer.	4 55	2.90 2.95
1400 El Dorado S.	11 11	50 50
510 Grand Prize.	11 11	35 35
140 Gould & Curry.	10 10	85 85
1030 Golden Chariot.	1 35	85 85
705 Gila.	1 40	71 71
425 Gen Thomas.	125 125	15 15
350 Hussey.	25 25	60 60
825 Hale & Norcross.	10 10	11 11
800 Independent.	80 80	23 23
185 Justice.	10 10	23 23
300 Julia.	2 10	1.50 1.50
430 Leopold.	11 11	1.65 1.65
1250 Leeds.	2 60	25 25
320 Modoc.	90 85	20 20
475 Manhattan.	4 35	81 81
150 Meadow Valley.	90 90	81 81
225 Martin White.	81 81	31 31
500 Mexican.	16 16	28 28
33 New Coso.	11 11	22 22
75 Northern Belle.	12 12	70 70
3380 Navajo.	75 75	80 80
350 New York.	2 30	450 450
260 Newark.	2 2	20 20
150 Ophir.	54 54	1065 1065

200 Dayton.	50 50
240 Exchequer.	4.45 4.55
860 Gould & Curry.	91 91
2495 H & Norcross.	91 91
130 Justice.	10 10
360 Julia.	2 10
10 Kentuck.	5 5
600 Lee.	1.40 1.45
300 Leviathan.	40 40
320 Lady Wash.	620 620
895 Mexican.	15 15
400 Monumental.	10 10
100 Morning Star.	60 60
420 Utah.	12 12
645 Ophir.	35 35
215 Overman.	22 22
80 Occidental.	11 11
100 Patten.	55 55
520 Savage.	11 11
260 Sierra Nevada.	51 51
200 Senator.	40 40
400 Solid Silver.	6 6
100 St Louis.	40 40
15 Seg Belcher.	33 33
100 South Justice.	80 80
420 Silver Hill.	2.90 2.95
120 Trojan.	70 75
150 Union.	15 15
345 Woodville.	55 55
500 Wells Fargo.	30 30
110 Yellow Jacket.	11 11
125 Argenta.	1 40
320 Alps.	91 91
960 Alta.	22 22
300 Andes.	1 1
230 Andes.	2 2
280 Bodie.	2 2
50 Belmont.	40 40
65 Best & Belcher.	20 20
120 Belcher.	5 5
150 Bechtel.	10 10

## SALES OF LAST WEEK AND THIS COMPARED.

Thursday A. M., Dec. 20.	Thursday A. M., Dec. 27.
1755 Alpha.	133 133
175 Alta.	21 621
33 Andes.	1.15 1.20
25 American Flat.	11 2650
10 Best & Belcher.	20 21
30 Belcher.	50 50
400 Bullion.	640 640
1260 Benton.	310 310
300 Boyle.	95 95
160 Chollar.	40 40
530 California.	23 23
425 Con Virginia.	210 210
540 Crown Point.	7 7
1580 Con Imperial.	1.05 1.01
550 Caledonia.	4.60 4.51
50 Challenge.	11 25
100 Dayton.	44 5
800 Dancy.	40 40
220 Exchequer.	4 1360
715 Gould & Curry.	10 10
10 Hale & Norcross.	10 10
1440 Justice.	10 10
350 Julia.	2 55
140 Kentuck.	54 55
40 Kosuth.	25 25
870 Lady Wash.	620 620
250 Leviathan.	40 40
900 Lee.	1 35
1565 Mexican.	15 15
1260 Monumental.	15 15
200 Morning Star.	60 60
200 Mint.	20 20
650 North Con Vir.	35 35
1225 New York.	24 24
120 Ophir.	120 120
80 Overman.	24 24
230 Occidental.	2 2
600 Patten.	55 55
400 Rock Island.	25 25
100 Succor.	30 30
375 Savage.	13 13
650 Sierra Nevada.	51 51
20 Seg Belcher.	35 35
1240 Silver Hill.	120 120
3700 Solid Silver.	6 6
500 Senator.	40 40
2030 St Louis.	40 40
800 Trojan.	30 30
280 Union.	7 7
145 Utah.	10 10
75 Ward.	60 60
890 Woodville.	1.55 1.50
670 Yellow Jacket.	11 11

Friday A. M., Dec. 21.	135 Overman.	241 241
10 Alpha.	135	6 67
175 Alta.	21 621	621 30
33 Andes.	1.15 1.20	230 140
25 American Flat.	11 2650	30 35
10 Best & Belcher.	20 21	30 35
30 Belcher.	50 50	71 71
400 Bullion.	640 640	30 30
1260 Benton.	310 310	11 11
300 Boyle.	95 95	11 11
160 Chollar.	40 40	12 12
530 California.	23 23	1.00 1.20
425 Con Virginia.	210 210	1.00 1.20
540 Crown Point.	7 7	3 3
1580 Con Imperial.	1.05 1.01	20 20
550 Caledonia.	4.60 4.51	15 15
50 Challenge.	11 25	10 10
100 Dayton.	44 5	66 66
800 Dancy.	40 40	10 10
220 Exchequer.	4 1360	4 63
715 Gould & Curry.	10 10	35 35
10 Hale & Norcross.	10 10	35 35
1440 Justice.	10 10	40 40
350 Julia.	2 55	28 28
140 Kentuck.	54 55	22 22
40 Kosuth.	25 25	40 40
870 Lady Wash.	620 620	40 40
250 Leviathan.	40 40	50 50
900 Lee.	1 35	1.05 1.01
1565 Mexican.	15 15	4.55 4.41
1260 Monumental.	15 15	30 30
200 Morning Star.	60 60	14 14
200 Mint.	20 20	55 55
650 North Con Vir.	35 35	50 50
1225 New York.	24 24	35 35
120 Ophir.	120 120	14 14
80 Overman.	24 24	1.40 1.60
230 Occidental.	2 2	10 10
600 Patten.	55 55	10 10
400 Rock Island.	25 25	11 11
100 Succor.	30 30	11 11
375 Savage.	13 13	11 11
650 Sierra Nevada.	51 51	25 25
20 Seg Belcher.	35 35	85 85
1240 Silver Hill.	120 120	23 23
3700 Solid Silver.	6 6	40 40
500 Senator.	40 40	31 31
2030 St Louis.	40 40	1 20
800 Trojan.	30 30	1.95 1.95
280 Union.	7 7	2 60
145 Utah.	10 10	2 60
75 Ward.	60 60	40 40
890 Woodville.	1.55 1.50	12 12
670 Yellow Jacket.	11 11	16 16

## Pacific Board—Latest Sales.

Wed. day A. M., Dec. 26.	200 Alpha.	12 12
60 Alpha.	12 12	2 2
150 Alta.	22 22	51 51
250 Belcher.	5 5	20 20
130 Best & Belcher.	20 20	31 31
1400 El Dorado S.	11 11	50 50
510 Grand Prize.	11 11	35 35
140 Gould & Curry.	10 10	85 85
1030 Golden Chariot.	1 35	85 85
705 Gila.	1 40	71 71
425 Gen Thomas.	125 125	15 15
350 Hussey.	25 25	60 60
825 Hale & Norcross.	10 10	11 11
800 Independent.	80 80	23 23
185 Justice.	10 10	23 23
300 Julia.	2 10	1.50 1.50
430 Leopold.	11 11	1.65 1.65
1250 Leeds.	2 60	25 25
320 Modoc.	90 85	20 20
475 Manhattan.	4 35	81 81
150 Meadow Valley.	90 90	81 81
225 Martin White.	81 81	31 31
500 Mexican.	16 16	28 28
33 New Coso.	11 11	22 22



The following companies have filed certificates of incorporation in the County Clerk's office at San Francisco:

AUTOCRAZ M. Co.—Dec. 21. Capital stock, \$12,000,000. Directors—Thos. Oole, L. B. Ward, W. H. Sears, J. P. Stuart and M. D. C. Gibson.

BALTIMORE M. Co.—Dec. 21. Location, Arizona. Capital stock, \$10,000,000. Directors—Ginto Curries, J. H. Williams, A. Thomas, F. W. Hadley and S. F. Stone.

ALTA CALIFORNIA M. Co.—Dec. 21. Capital stock, \$5,000,000. Directors—O. F. Willey, A. J. Bryant, E. Fellows, F. Reichard, and J. A. Robinson.

WENROOT M. Co.—Dec. 22. Location, Arizona. Capital stock, \$5,000,000. Directors—John F. Snow, John Doran, J. J. Jilder, W. Weeks and James Kinsman.



## THE ENGINEER.

### Rafting a Sink.

Among other improvements recently made upon the line of the Detroit & Milwaukee railroad is the following, as described in the *Engineering News*, of Chicago: Six miles east of Grand Rapids, and on the summit of a grade, is the Saddle-Bag swamp, a deep sink hole of 2,600 feet in length, 50 feet deep in the center, and 60 feet to clay. The contents of this hole are water and muck, and the thin crust which covered the mass incapable of carrying but a very light weight. A former engineer had attempted to build a roadway over this hole, but after he had dumped a good deal of material into it with little prospect of succeeding, the attempt was abandoned, and for 20 years the roadway has been maintained on seven and eight degree curves around the northern top of the slough. This season Mr. Masson, the engineer of the road, attacked the problem with his slabs and sand, and in three months with one train, 50 men on the train and 25 on the dumps, raising track, etc., and at a cost of \$10,000 in all, a solid roadway was carried over the hitherto unpassable ditch, and all trains are now running across it. Slabs and edgings 16 feet long were laid down and firmly bound together by being crossed, until a raft ten feet thick was built, upon which the train of sand cars could be run. Sand was hauled on until the sinking of the road-bed ceased, and the track was brought to grade. The greatest difficulty to contend with was the tipping of the rafts, which were a source of great annoyance, and had to be carefully guarded against. The roadway is now suspended over the hole by this raft, and no fears are entertained as to its permanence, since there is no outlet for the water and no chance for a washout. If the water could be drawn off by means of a drain, which, however, would need to be nearly 50 feet under ground, the road-bed would be made still more permanent. In the saving of wear and tear of rolling stock and rails in the sharp curves, the cost of the improvement will soon be made up.

### The Ten-Inch Railway.

We have formerly alluded to the building of a railroad with ten-inch gauge in Massachusetts. It is called the Bilerica & Bedford road.

The proprietor or inventor of this road is named George E. Mansfield, who is a practical wood and iron machinist and engineer. There are 11 bridges on the route of this road over 100 feet long. The rail weighs 25 pounds to the yard, though it is believed that 20 pounds to the yard would be sufficient. One grade on the road is 155 feet. The cars and engines of the road are very well proportioned, and make a very handsome appearance. The engine is behind the tender, and next the cars, so that when the train moves the car next the engine draws down upon and increases the adhesion of the engine to the track. Both engine and cars are constructed so as to be very near the ground, giving great advantage in regard to safety, also very little oscillation. The cars have an aisle, with one seat on each side, in the same manner as ordinary cars have two seats. The length of the cars allows 30 seats, each person having a seat to himself. The cars are warmed with steam, and well ventilated, have closets, water-tank, all the modern improvements, Westinghouse brakes, etc. They weigh but four tons and a half, ordinary cars weighing on an average 18 tons. Hence Mansfield will carry 60 persons with cars weighing nine tons, while ordinary roads must draw 18 tons to carry 56 persons. An Eastern exchange says: The engines are equally light and less costly than on ordinary roads. It is quite evident that a road eight and a half miles long, which cost equipped \$1,500 less than \$50,000, and which can be run for half the expense upon ordinary roads, must be a great and noble achievement. The road cost \$4,500 per mile, the right of way free. The trains run about 20 miles per hour. Engines weigh about eight tons, and draw two passenger and two freight cars twice per day each way, at a cost of coal only one-fourth that of ordinary engines.

U. S. NAVAL SCHOOL FOR ENGINEERS.—The United States dispatch boat *Tallapoosa*, which left for Philadelphia and Washington on Friday, transferred to the training-ship *Minnesota*, before her departure, the first class of boys for instruction in the engineering department of the Navy. The *Iron Age* says: The idea of training boys as first-class firemen and machinists for the navy originated with Capt. A. W. Johnson and Engineers Wharton and Magee, and thus far the results have made greater progress than was at first anticipated. There are already two classes of this character under courses of most careful instruction, and their acquisition to the service, it is stated, promises to give it what has long been felt to be a great need, namely, fireman and machinists who could be trusted on shore as well as on board ship, with ability vouchsafed for by responsible persons and men of good character. The boys for the engineering classes are selected from those who enlist in regular order and who show a marked proficiency in mechanical studies. Besides their mental course of instruction on board ship, they also receive mechanical instruction in the machine shop at the navy yard dur-

ing this winter and on board of cruising vessels during the summer. At first the idea was tried as an experiment, but it has met with such valuable results that it is intended to continue organizing new classes. About 200 boys are at present under instruction in various studies on board the *Minnesota*, but Capt. Johnson says that he finds considerable difficulty in obtaining and maintaining the number allowed, owing to the mistaken impression that the training-ships of the navy are reformatory institutions.

DEEP SEA PLOWING.—It seems they are beginning to run plows on the sea bottom to loosen up the soil for the dredges. The *Journal of Chemistry* says: "During the past summer we witnessed this deep sea plowing in the harbor of Belfast, Maine. The bottom of the bay is covered with a tenacious, clayey deposit, into which the steam shovel penetrates with difficulty, and to loosen it a huge Michigan plow was set at work under the water, drawn by steam power on the shore, using a wire rope to form connections. The water at high tide was about 20 feet deep when the plow was working. The man that held it was encased in the diver's armor, and supplied with air by a flexible tube connecting with an air-pump on board of a vessel floating above. He came up at our request, and after removing his air-tight helmet, and conversing a few moments, was again put in connection with the pump, and, disappearing under water, went on with the plowing. This to us was a novel proceeding, and, so far as we can learn, it was the first experiment of the kind ever made."

THE FRENCH AND THE DARIEN CANAL.—We notice that the French are still agitated about canaling our isthmus, and Lesseps, the Suez hero, is enlisted in their projects. We read that a geographical society of Paris has lately sent out an expedition under Lieut. Wise to discover the best route. This officer has made a report, in which he favors the scheme of cutting a direct canal in a straight line, south of the Panama railway, from the Chuquisaca northeast to Port Gande, which he asserts can easily be done, the ground being completely level and presenting only relatively narrow masses of earth to be removed should it be decided to form a tunnel. In his opinion, an inter-oceanic canal by way of Columbia will soon and easily be made. Viscount de Lesseps, who constructed the Suez canal, is understood to be the advising engineer of the French Darien Canal Association. French capital, science and enterprise have accomplished wonders in the Suez canal, and may achieve equal triumph on this continent if we have no ambition that way ourselves.

THE TENNESSEE RIVER IMPROVEMENT.—There was held last week at Chattanooga a convention to urge upon Congress the importance of a more vigorous prosecution of the work of making a ship canal through the mussel shoals of the Tennessee river. The governors, boards of trade and public-spirited citizens of three States took part in the movement, which thus acquires something of national importance, and invites a measure of attention rarely given to schemes of local improvements outside of the neighborhoods to be immediately and chiefly benefited. The improvement of the Tennessee river cannot, however, be regarded as a local improvement, and a consideration of the facts of the case should disarm any opposition which may grow out of a misconception of the importance of the work, already about half completed.

MICHIGAN SHIP CANAL.—The convention to favor the construction of a ship canal across Michigan held at Allegan in that State, Nov. 16th, was attended by about 150 persons from along the proposed line. Resolutions were adopted stating that the proposed canal would shorten the water distance between Chicago and Buffalo 500 miles, would "lessen insurance, reduce the freight rates, prolong the season of safe navigation for two months, and greatly lessen the dangers of commerce over the present hazardous route via the straits of Mackinaw," and calling upon Congress for an appropriation of \$25,000 for an official survey. No estimate seems to have been presented of the probable cost of the work.

THE CINCINNATI SOUTHERN RAILROAD.—The Cincinnati *Commercial* says: There is a very fair prospect now for an early extension of this Southern railroad for 20 miles beyond the present terminus—Somerset—to the coal mines, below the Cumberland river.

THE SOUTHERN PACIFIC.—More passengers and freight than usual are being transported over the Southern Pacific railroad, and the business of the company is gradually increasing. A large supply of steel rails, imported from the East, together with cross-ties, timber and other material from California and Oregon, are now lying at Oakland in readiness for immediate use. Surveys have been completed from Yuma, the present terminus, to a point 160 miles distant, near Maricopa Wells, where the road is expected to reach ere long. A strong force of men, who are now engaged in finishing another job, will, it is said, be shortly put to work, when the track will be laid at the rate of two miles per day. Other and extensive preparations are soon to be made to push the road forward, and it is the intention of the Directors for it to be at El Paso, some 500 miles from Yuma, in less than two years hence.

### Workmen on the Comstock.

The *Virginia Enterprise* says: We believe it to be right, and that we shall be doing the miners and other working men of the Pacific coast a kindness by warning them against rushing hither in the expectation of obtaining employment, expending in so doing the last cent (in the majority of cases) of their slender means. The advance in price of the leading mining stocks which followed the new ore development on the 1,900-foot level of the Ophir mine, would seem to have turned hitherward all the wandering, undecided laboring men of the Pacific coast.

Noting the rise in stocks, and the corresponding improvement in times along the Comstock, men in search of employment quite naturally concluded that there would be an opportunity for them to find work in the mines, mills, or on the surface, in some of our towns. But in this they made a sad mistake, as great numbers have found to their sorrow and their cost.

There are miners enough and workmen enough of every kind belonging here on the Comstock lode to do twice the work there is at present to be done in any branch of business. The sooner this is understood abroad the better—the better for us who are here to find that they have made their journey and expended their little means for naught.

Let persons at a distance call to mind the lines they have seen formed in front of post-offices in the early days, and they will have some idea of the chance there is of their getting work, here when we tell them that at every mine and mill in the country there are men enough waiting for work to form a line from 10 to 40 rods in length.

These lines are not actually formed, but this condition of affairs here is substantially the same, as far as outsiders are concerned, as though they were. The men are here, waiting and watching. As fast as one man steps out of a mine, or is killed, another steps in and takes his place, provided men are being taken at all. For a considerable length of time many more men have been drafted out of the mines than have been taken in. All these are now here waiting and hoping that something may occur that will cause additional forces of workmen to be put to work in the principal mines. What chance, then, for newcomers, when so many old miners are out of employment?

It may not be generally known to the outside world, but owing to the scarcity of work here at this time there are many families that are being constantly assisted by our Relief Committee. Women and children, and not unfrequently men, are to be seen at the several mines waiting for the men to come "off shift" in order to get what food may happen to be left in their lunch pails.

Men coming here now will not only obtain no employment, but will—provided they come without means to get away—swell the ranks of the destitute and add to the distress of those who are already the recipients of charity.

What has been said above in regard to the present opportunities of obtaining employment in our mines and mills will apply equally well to all other industries and branches of business. Our carpenters had no work worthy of the name last summer; the painters found next to nothing to do; blacksmiths and mechanics of all kinds were out of employment, and hosts of workmen in all these trades are still searching for work.

Men who want work will do better in the small mountain towns of California, or on the ranches of that State, this winter, than by coming here. There they will at least be sure of getting something to eat, even though the wages they receive be small. Let men who are out of work go to the ranches and split rails, dig ditches, herd stock—do anything rather than come here to swell the army of the idle.

### Mining at Fiddletown.

Mining operations on a more extensive scale than Fiddletown has known for many years, says the *Amador Ledger*, are now in progress in this ancient camp. Auriferous channels are known to exist in the vicinity, and in early days the miners raked in the golden harvest without much difficulty. As time wore on and the surface deposits became exhausted, the expense of working became greatly augmented, stretching beyond the means of the individual miner. Depression brooded over the camp, awaiting the advent of moneyed men to dispel it. The gold-bearing sands were known to reach far deeper than the workings had heretofore gone, but the vast outlay of capital requisite to provide an outlet for the water and debris was a responsibility which only capitalists could venture to assume. Two years ago the American Flat Gravel company was formed and purchased most of the claims around Fiddletown. For a time all was bustle; the roar of three or four giants was kept up day and night. But the difficulty of providing dumping facilities cropped up again. Five men were frequently employed to keep the boxes clear of debris. To obviate this difficulty a Cranson elevator was put up to raise the dirt and ensure a greater fall of water. This contrivance proved not a success, whether from unskillful management or otherwise we are unable to say. The company got involved, the stockholders became disheartened, and work was brought to a standstill. Faith in the richness of the deposits remained unimpaired. A shaft sunk within a few feet of one of these

banks revealed the fact that the pay dirt in that spot was 60 feet through; some of it, we are told, prospecting as high as \$1 to the pan. Latterly the company has changed hands. C. J. Garland, owner of the Sutter Creek and Drytown sulphur works, than whom a more enterprising man lives not in Amador county, is now the moving spirit of the enterprise. With other men of means, he has bought out the company, leased the Purinton ditch, and has started in to open up the mines in a thoroughly scientific manner, regardless of cost, believing that the most efficient method will prove the cheapest in the long run. A. Harris is the new Superintendent. He is the right man in the right place, his extensive experience in mining in California, Nevada and Arizona rendering him peculiarly fitted for the position.

On Saturday last we visited Fiddletown, and in the absence of the Superintendent, C. A. Purinton, one of the live men of the town, kindly undertook to show us over the works. We were surprised at the magnitude of the preparations to open out the property. A race 3,000 feet long is being cut to tap the nearest claim on Slate creek, the terminus being at a point of the creek where the rapid descent will give the water sufficient velocity to carry away the debris. There were 70 men in all working upon the race. The undertaking is being pushed ahead with the utmost energy, under the able foremanship of J. Hippart. The cutting in some places is over 13 feet deep and will average six or seven feet, mostly blasted through solid rock. The boxes are 30 inches each way, constructed in a substantial manner out of 1½-inch timbers, with sills four inches wide. Ground was first broke on the last day of October, and at the time of our visit the cutting was finished for two-thirds of this distance, and 97 boxes out of a total of 186 were in position. It is calculated that the job will be completed by the 1st of January next. It will undoubtedly be the finest piece of work in the county. The total cost will approximate \$12,000 or \$15,000. When it is remembered that the race will enable the channel of pay dirt to be robbed of its golden wealth for 25 or 30 feet deeper than heretofore, the outlay is not extravagant. A fair-paying placer claim will soon repay this sum. The ground owned by the company will require many years to work out. Should this venture turn out remunerative, it will open up a long era of prosperity for Fiddletown and vicinity. The company expect to use this winter, upon their claims alone, 600 inches of water.

### Smelting Ores.

Those of our people who shall next spring go forth into the wilds for the purpose of prospecting for new mines will undoubtedly keep a bright lookout for smelting ores. The permanence and prosperity of Eureka and other mining towns and camps where smelting ores are worked have given our prospectors a much more exalted idea of the value of base metal veins than they entertained in regard to such mines in former times. Besides there is now beginning to be a market for such ores. At various points along the Central Pacific railroad there are parties ready to purchase them. A man who may have the good fortune to find a lode yielding rich argentiferous galena, or any other smelting ore, at a point not too far distant from the railroad may at once begin to reap his reward. It is not necessary for him to put up a furnace or make any great outlay of money for any purpose. With an ordinary windlass and a few tools he may extract his ore and haul it or pack it to the railroad and either sell it on the spot or ship it, when he shall have accumulated a carload, to the nearest point where he can have it smelted.

It is not necessary for him to await the slow assistance of timid capital. Although he may begin operations in quite a small way, he will have the satisfaction of feeling that he is quite independent and secure from the delays and machinations of greedy and selfish manipulators. Soon, provided he have a mine of real value, he will be able to erect a furnace, smelt his own ores, having preserved his independence and the entire control of his business from the first.

In the regions skimmed and scratched over by the early prospectors, who were in search of free milling ores, there is still a good field for miners who are in search of ores for smelting. Some of the best smelting ores present such an unattractive appearance, from the iron and other base metals they contain, that the pioneer prospector hardly halted to look at the veins in which they were contained. A certain per cent. of iron is necessary in smelting, and if it be not found in the ore that is to be operated upon it must be added, yet many veins of very valuable smelting ore have undoubtedly been run over by prospectors, who thought them nothing more than deposits of a poor quality of iron ore.

Not only do the base metal lodes offer a field in which the poor man may obtain adequate return for his outlay of muscle, but they are also worthy of the attention of men of capital. The day is not far distant when ores now considered to be of a very low grade will be profitably worked, either here or at some point to which they may be cheaply shipped. It has been ascertained that base metal mines may be depended upon as regards permanence, therefore, those who shall now secure such mines, by patent or otherwise, will one day be able to draw from them regular and handsome incomes. Trains of cars loaded with these ores may be run as cheaply as the gravel trains are run.—*Enterprise.*



## Condition of National Banks.

The following is an abstract of reports made to the Comptroller of the Currency, showing the condition of the national banks in the United States at the close of business on Monday, the first of October, 1877. There are 2,080 banks in operation:

RESOURCES.	
Loans and discounts.....	\$ 888,243,200
Overdrafts.....	3,677,303
United States bonds to secure circulation.....	\$36,510,950
United States bonds to secure deposits.....	14,903,000
United States bonds on hand.....	30,088,700
Other stocks, bonds and mortgages.....	34,435,965
Due from approved reserve agents.....	73,284,138
Due from other national banks.....	45,217,246
Due from State banks and bankers.....	11,415,703
Real estate, furniture and fixtures.....	45,229,983
Current expenses and taxes paid.....	6,015,792
Premiums paid.....	9,219,174
Checks and other cash items, exchanges for clearing house.....	74,625,215
Bills of other national banks.....	15,581,784
Fractional currency.....	2,376,083
Specie, viz: gold coin.....	4,309,656
Silver coin.....	3,700,703
United States certificates.....	14,088,460
Legal tender notes.....	60,820,084
U. S. certificates of deposits for legal tender notes.....	35,410,000
Five per cent. redemption fund.....	14,494,633
Due from U. S. Treasurer.....	1,527,119
Total.....	\$1,741,084,080
LIABILITIES.	
Capital stock paid in.....	\$ 470,467,771
Surplus fund.....	122,776,121
Other undivided profits.....	44,572,078
National bank notes outstanding.....	291,874,236
State bank notes outstanding.....	481,755
Dividends unpaid.....	3,623,703
Individual deposits.....	610,403,957
United States deposits.....	7,972,714
Deposits of U. S. disbursing officers.....	2,376,083
Due to other national banks.....	115,028,954
Due to State banks and bankers.....	46,577,439
Notes and bills rediscounted.....	3,791,219
Bills payable.....	6,137,116
Total.....	\$1,741,984,080

**GERMAN COAL.**—Hamburg has been the scene of a rather novel exhibition, that of German coal, which, we are told, has excited much interest among German patriots and commercial men. The idea that Germany should endeavor to emancipate herself from the English market and produce her own coal has, it appears, acquired a powerful hold upon the national imagination and hence the promotion and development of the German coal trade has come to be looked upon as a matter of patriotism. It is also alleged that Westphalian coal is superior in heating power to English, and Senator Godeffroy, in his address on the occasion of the opening of the exhibition, even made it appear that Germany is in possession of coal fields incomparably larger than any that England can show. The Westphalian coal basin alone, said M. Godeffroy, is capable of producing for seven centuries to come the same quantity of heat coal annually that all England now yields, and beyond this the basin is not yet fully explored, and is probably capable of material extension. With all these supposed advantages Germany has not yet been able to heat England out of the field on her own ground. The *City of Hamburg* imported in 1876 about 1,500,000 tons of coal, of which about six-sevenths were the produce of England, and only one-seventh of home production.

**TRYING TO LIVE WITHOUT WORK.**—The following, from the pen of Horace Greeley, is true and applicable to this day: "Our people are too widely inclined to shun the quiet ways of producing labor, and try to live and thrive in the crooked paths of speculation and needless traffic. We have deplorably few boys learning trades, with ten times too many anxious to get into business; that is, to devise some scheme whereby they may live without work. Of the journeymen mechanics now at work in this city we judge that two-thirds were born in Europe, and the disparity is steadily augmenting. One million families are trying to live by selling liquors, tobacco, candy, etc., in our cities, who could be spared therefrom without the slightest detriment; and if these were transferred to the soil, and set to growing grain, meats, wool, etc., or employed in smelting the metals, or weaving the fabrics for which we are running into debt in Europe, our country would increase its wealth at least twice as fast as now, and there would be far less complaint of dull trade and hard times."

**LOWELL AND LIBERTY HILLS.**—The Swamp Angel is turning out pay all the time, at about the rate of \$3 per car load, the pay being found about 1,500 feet in length on the channel, and they have drifted several hundred feet across the channel with good pay dirt all the way. Below the Swamp Angel, on the Steep Hollow side of the ridge, W. P. Dewey is driving a tunnel into the Levy ground, of which he was the purchaser, and below this the East New York company, and also the Wild Cat company are tunneling for the channel. On the opposite or Bear river side of the ridge, the Planet company is the only one at work. Their tunnel is now in 600 feet, 100 feet having been made in the past month. The contract is for 800 feet of tunnel, which will be completed by the 1st of March. The Planet ground comprises 229 acres, and it adjoins the Swamp Angel near the center of the ridge. This is regarded as one of the very best claims in that portion of the county, it covering a portion of the same rich channel found in the Swamp Angel, and from which a large amount of gold has been taken.—*Grass Valley Union.*

## USEFUL INFORMATION.

## Manufacture and Uses of Bird Lime in Japan.

Bird lime or "mochi" is extensively produced and used in Japan, as we learn from a recent report by a British Consul. The principal tree from which it is made is a dark evergreen, having its habitat in the southern half of Japan; it grows high up the shady sides of deep mountain glens. Its bark is of a greyish-brown color, and roughish texture; the leaves are opposite, smooth, dark-green, rather more pulpy than the English holly leaf, ovate-acuminate in form, have an unbroken linear edge, a very short petiole, and almost imperceptible stipules. Its efflorescence is a panicle, centripetal in its development, having small white, wax-like diandrous and monopetalous florets, which are also slightly cruciform.

The manufacture of bird lime extends over a period of several months commencing about June, when the bark of the mochi tree is stripped off and macerated in water for about 40 days, after which it is collected and beaten in a mortar. The pestle is slod with iron, the flat under surface of which is armed with spikes projecting downwards. When the pulpy mass under the pestle becomes glutinous, it is taken out and washed in water. This is done to remove as much as possible of the rough outer bark, and the pulp is then again pounded and treated in a cauldron with hot water, on the surface of which it floats. During this treatment it undergoes continual manipulation at the hands of the workman, for the purpose of disengaging the remaining particles of bark, which sink to the bottom of the boiler. This is the most difficult part of the process, as considerable skill and experience are required in the workman to keep the stuff from adhering to his hands. After this it is again washed in cold water, and the pounding, boiling and washing are repeated until the material becomes sufficiently clean and pure. During the above process about nine-tenths of the weight of the raw material is lost, 250 catties of the latter not turning out more than 25 of good bird lime.

The uses to which this article is put by the Japanese are more extensive and diverse than one would suspect, its principal one being, of course, for the snaring of birds and animals. By its means animals as large as monkeys are caught. When they once get the stuff upon their paws they soon cover themselves with it and so exhaust themselves in trying to get rid of it that they fall an easy prey. Birds also as large as ducks are taken. Rats are easily caught by spreading a small quantity on a piece of board or paper, and placing it near their holes. It is spread upon a bamboo leaf and universally used throughout Japan during summer for catching flies or other insects. It might be as well to mention that a very inferior quality of bird lime is made out of wheat by most of the "fuga" (makers of wheat food); it soon loses its properties and becomes useless.

**BOXWOOD.**—The wood of *Buxus sempervirens*, which is almost exclusively used for the best kinds of wood engraving, has been for some years becoming more and more scarce. Wood of the largest diameter is the produce of the forests of the countries bordering on the Black sea. Large quantities are produced in the neighborhood of Poti, from which port the wood is shipped direct to England. The supply, however, from this port is, we learn, becoming fast exhausted, and it is said, unless the forests of Abkhassia are opened to the trade, it must soon cease altogether. The quantity exported from Poti during the year 1873 amounted to 2,897 tons, of the value of £20,621; besides this, from 5,000 to 7,000 tons of the finest quality annually pass through Constantinople, being brought from southern Russia and from some of the Turkish ports of the Black sea for shipment, chiefly to Liverpool. An inferior and smaller kind of wood, supplied from the neighborhood of Samson, is also shipped at Constantinople to the extent of about 1,500 tons annually. With regard to the boxwood forests of Turkey, the British Consul at Constantinople reports that they are nearly exhausted, and that very little really good wood can now be obtained from them. In Russia, however, where some little government care has been bestowed upon forestry, a considerable quantity of choice wood exists; but even there it can only be obtained at an ever-increasing cost, as the forests near the sea have been denuded of their best trees. The trade is now entirely in English hands, although formerly Greek merchants exclusively exported the wood. In the province of Trebizonde the wood is generally of an inferior quality; nevertheless, from 25,000 to 30,000 cwts. are annually shipped, chiefly to the United Kingdom.

**TO REMOVE SILVER STAINS FROM WOVEN FABRIC.**—The following process is said to be especially successful in removing spots from materials which have been several times washed: First prepare a saturated solution of chloride of copper; dip the spotted piece in the solution, and allow it to remain some minutes, or according to the character of the stains. Then rub the stains with a crystal of hyposulphite of soda. When neutral chloride of copper is used, the color of the stuff does not change. This process can be repeated.

**ACRES OF COAL AFLOAT.**—The amount of coal shipped from Pittsburgh to ports on the lower Ohio and the Mississippi on the present high water, gives some idea of the vastness of our internal commerce. The *Iron Age* says: In a little over 24 hours 8,344,224 bushels of coal left the harbor of Pittsburgh. The bushel being 76 pounds, this would be 317,081 net tons, requiring a fleet of 51 steamers or tow-boats, 201 coal boats and 335 coal barges. On the basis of 100,000 bushels to the acre of mine surface, there would be 83½ acres of coal, and the boats and barges would cover an area of about 45 acres, so that each steamer would tow, on an average, about an acre of boats and two acres of coal as measured in the vein. The towing is not by line, with the boats following after the motor, as the term would seem to imply. With a tow of, say, 12 boats or barges, one would be lashed to each side, while ten would be placed in front, five long and two wide, each barge being about 130x24 feet. This mass of boats is firmly lashed together, the steam tow-boat in the rear, and the flotilla is propelled ahead of it. This system of towing began in 1850, the *Lake Erie* making three trips with four barges carrying 16,000 bushels. Before this time all the coal was floated down the river in large flat-bottomed boats propelled by muscle and tide. Each boat contained 15,000 bushels, and were "run" to their destination in pairs.

**TAR WATER FOR INSECTS.**—For the last five years I have not lost a cucumber or melon, vine or cabbage plant. Get a barrel, with a few gallons of gas tar in it; pour water on the tar; always have it ready when needed, and when the bugs appear give them a liberal drink of the tar water from a garden sprinkler, or otherwise, and if the rain washes it off and they return, repeat the dose. It will also destroy the Colorado potato beetle, and frighten the old long potato bug worse than a threshing with a brush. Five years ago this summer, both kinds appeared on my late potatoes, and I watered with the tar water. The next day all Colorado beetles had not been well protected from the sprinkling were dead, and the others, though their name was legion, were all gone, and I have never seen one of them on the farm since. I am aware that many will look upon this with indifference, because it is so cheap and simple a remedy. Such should always feel both their own and their neighbors' hugs, as they frequently do.—*Chicago Tribune.*

**TO WASH RED TABLE LINEN.**—Use tepid water, with a little powdered borax, which serves to set the color; wash the linen separately and quickly, using very little soap; rinse in tepid water, containing a little hoiled starch; hang to dry in the shade, and iron when almost dry.

## GOOD HEALTH.

## Drinking Water.

Water, says a writer in the *Prairie Farmer*, should be discreetly used. An excess of water dilutes the gastric juice, and lessens its digestive force. In small portions it may aid digestion if the food has been only partially dissolved, and retains its solid form when it has reached the stomach. Experience and observation show that a small amount only of any drink, hot or cold, should be taken with or after our daily meals.

Warm drinks, or infusions, ordinarily promote the exudation of the digestive juice, hasten the contents of the stomach into the duodenum just below, favors intestinal digestion, and aid the passing of the nutritious portions of the food into the circulation of the blood. Food only partially dissolved in the gastric sack is floated by water into the upper part of the intestinal canal and there exposed to more complete solution and fitness for absorption.

A proper amount of water, then, favors the nutrition of our food and promotes the secretion of all the glands. Large amounts of cold water may obstruct the tubes through which any secretion, as milk, may flow. May not warm water, slightly salted, contribute to the lactic secretion of cows and other animals? A warm bowl of milk, or gruel, taken between meals, increases the natural supply of infantile food.

Luke warm water, or a weak infusion of mustard, so weak as hardly to be tasted, forms a better emetic than any other material for relieving a crowded or distended stomach. All food that cannot be digested, should be at once removed. Half a pint of mustard water is usually enough, but repeat the draft every 15 minutes until it proves effective.

The good or ill effects of water are not limited to the stomach, but are equally apparent in the intestines. It not only transmits the digested food over their large extent of surface, but aids the lacteals in its absorption and keeps the waste in proper motion.

Hence drinking water early in the morning may be of great use to those who are annoyed by constipation. The bad taste in the mouth, the want of appetite at breakfast, may be usually corrected by drinking hot or cold water an hour before taking the morning meal. As free water drinking may remove constipation so it may cause diarrhea if taken in excess.

## The Hygiene of the Eyes.

The following hygienic rules are compiled and condensed from eminent French and English authorities: For the worker the light should come as much as possible from the left side, that is to say, from the side towards which one turns in working. Daylight is the best; but direct sunlight and that reflected from mirrors should be avoided. The aspect should be northern, and the light should come a little from above.

White walls should be avoided; highly varnished tables and, in workshops, shining articles like silk should be protected from the sun's rays.

Artificial light is always bad on account of the heat and the exhalation of carbonic acid. The best is that of lamps fed with vegetable oil (much used in France, but seldom in this country) and furnished with a glass shade. Gas is bad, because of its heat, brilliancy, and mobility; the light of mineral oil is too hot; that of candles insufficient and flickering. The eye of the workman should avoid the light coming to him directly or diffused through the room.

Working immediately after meals is objectionable; also uninterrupted use of the eyes for long periods of time. One should write on an inclined plane, and not keep the head bent down more than is absolutely necessary. Reading in bed is bad everywhere.

Some good authorities commend washing the eyes with cold water, but the majority of the best ophthalmologists advise the use of hot water for the less serious affections of the eye. For tired eyes we believe, from our own experience, that water hot as can be borne is refreshing and beneficial.

If the eyes are fatigued by bad artificial illumination, blue or slightly smoked glasses will be useful, and in order to avoid the lateral rays they should be large and round.

If the irritation of the eyes persists, all work must be abandoned, and an examination made to see if there be any disturbance of refraction, of power of accommodation, or of the mobility of the eyes.

Presbyopia, or so-called "far-sightedness," supervenes earlier with those who are constantly at work than with other individuals, and as soon as it does convex glasses should be at once resorted to, without which the muscle of accommodation would be fatigued to no purpose. At first they should be used for working in the evening, after the fatigue of the day; but a long-sighted person should only use spectacles for looking at near objects, not at far ones.

Work requiring close application favors the development of myopia, or "near-sightedness," precisely in proportion as the conditions of illumination are bad. If the action of these causes continues, the myopia will increase until vision is lost.

A slight degree of myopia may be favorable to close work, but, as a general rule, work requiring close application, by the derangement of circulation that it inevitably induces in the eye, is much more injurious to the myopic, and is the great cause of the development of myopia and its complications. Young people should be examined, and if they are myopic, hindered from undertaking tedious studies and all professions demanding close application of the eye.

**DRINK FOR WORKERS.**—In a leaflet circulated by the Church of England temperance society on harvest work, the following recipe is extracted from the valuable hook on "The Personal Care of Health," by the late eminent Dr. Parkes: "When you have any heavy work to do, do not take either beer, cider, or spirits. By far the best drink is thin oatmeal and water, with a little sugar. The proportions are a quarter-pound oatmeal to two or three quarts of water; it should be well hoiled, and then one ounce or an ounce and a half of brown sugar added. Shake up the oatmeal well through the liquid. In summer, drink this cold; in winter, hot. You will find it not only quenches thirst, but will give you more strength and endurance than any other drink. If at any time you have to make a very long day, as in harvest, and cannot stop for meals, increase the oatmeal to half a pound, or even three-quarters, and the water to three quarts. If you cannot get oatmeal, wheat flour will do, but not quite so well. For quenching thirst few things are better than weak coffee and a little sugar; one ounce of coffee and half an ounce of sugar hoiled in two quarts of water and cooled, is a very thirst-quenching drink. Cold tea has the same effect, but neither are so supporting as oatmeal. Thin cocoa also is a very refreshing and supporting, but more expensive than oatmeal."

**POISON IN THE MILK PAIL.**—A Georgia correspondent of the *New York Tribune* cites a case of poisoning from drinking buttermilk. Instances of nausea with symptoms of poisoning occur every now and then, not only from the use of buttermilk, but milk itself, and also the butter and cheese made from it. These cases all have a similar origin, namely: poisonous ferments taken into the milk through the body of the cow from her partaking of bad food or water. They are developed in buttermilk by the agitation in churning, and they are intensified by concentration in cream, butter and cheese. Such instances indicate the strong necessity for watchfulness in guarding against decaying food and bad water for milch cows. Scalding the new milk before setting, and setting shallow so it will soon cool, prevents every such occurrence by killing the ferment.



# MINING SCIENTIFIC PRESS

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THE ORIGINAL ARTICLES in this paper are mostly set in solid type, giving in our columns one-third more reading than is contained in ordinary leaded matter.

Our latest forms go to press on Thursday evening.

SAN FRANCISCO:

Saturday Morning, Dec. 29, 1877.

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## The Week.

The rain is the topic which strikes the most tuneful chords. That which fell on Sunday last had more marks of an effective, and we may say business-like, storm than any we have had for many months. It was indeed a sharpener of zest for Christmas and its merry-makings in all homes, both in city and country. It was in itself a Christmas gift to a waiting State. To show the area covered by the storm and the measure of the downfall, we compile the following table, which is true to Dec. 25th:

LOCALITY.	Last Storm.	Season.
	Inches.	Inches.
Niles, Alameda Co.....	1.02	3.26
Pleasanton, Alameda Co.....	.60	2.20
Livermore, Alameda Co.....	.44	2.15
Midway, Alameda Co.....	.31	1.33
Ellis, San Joaquin Co.....	.61	1.61
Lathrop, San Joaquin Co.....	.62	1.72
Stockton, San Joaquin Co.....	.59	2.29
Brighton, Sacramento Co.....	.47	2.62
Modesto, Stanislaus Co.....	.62	2.55
Merced, Merced Co.....	.49	2.03
Fresno, Fresno Co.....	.38	1.30
Tulare, Tulare Co.....	.75	1.53
Delano, Kern County.....	.52	2.34
Caliente, Kern Co.....	.70	3.13
Los Angeles, Los Angeles Co.....	.84	—
Santa Barbara, Santa Barbara Co.....	.53	4.35
San Buenaventura.....	—	3.25
Colton, San Bernardino Co.....	.67	—
Chico, Butte Co.....	1.54	5.74
Tehama, Tehama Co.....	1.00	—
Red Bluff, Tehama Co.....	.75	—
Redding, Shasta Co.....	2.05	—
Napa, Napa Co.....	.51	—
Woodland, Yolo Co.....	.44	—
Williams, Colusa Co.....	.37	—
Santa Cruz, Santa Cruz Co.....	1.41	7.00
Salinas, Monterey Co.....	1.57	3.00
San Francisco.....	.85	4.54

This table shows that the rainfall reached nearly all sections attainable by rail and from which reports have come. On the mountains the snow fell quite freely, from 5 to 18 inches in depth being reported at different points along the railroad crossing the Sierras. This downfall has been of incalculable value and revives all to the hope of more to come.

## Close of the Volume.

With this number we close volume XXXV of the MINING AND SCIENTIFIC PRESS, only to begin with renewed vigor the thirty-sixth. The full and complete index on the last page, the preparation of which in itself is no little labor, will be of great convenience to those who keep the files of the PRESS. A glance at this index will show the variety of subjects which have come under our observation during the past half year, and prove, moreover, the value of this journal to its industrial readers. The index embraces a very wide range of subjects, every topic which would be of interest to the miner, mechanic, manufacturer or lover of science having been touched upon more or less according to its importance.

We have given from week to week the current mining news from the various counties of this State and the districts in Nevada, Colorado, Utah, Idaho, Montana, Oregon, Arizona and New Mexico. There is scarcely a mine that has not been more or less frequently mentioned in the "Mining Summary." This news has been presented in a condensed form and segregated in counties and districts for ready reference. We have given every week the daily prices of mining stocks, the highest and lowest prices for the week and a review of the market. The table showing the assessments levied, dividends paid and meetings to be held has been carefully corrected and furnishes in itself a complete "Mining Shareholders' Directory."

The amount of hullion shipments from prominent mines has also been carefully compiled each week. While paying more direct attention to home mining affairs, we have let no opportunity escape to profit from the experience of older countries and have described in detail such new appliances or processes as from time to time have appeared. Where necessary, these have been described with the aid of engravings, as have such new mechanical devices as we have thought would be of utility on this coast.

In the department of "Mechanical Progress" we have collated from domestic and foreign exchanges everything of interest occurring elsewhere, and have given in a condensed form descriptions of all the new devices and inventions or improvements on old ones which have been brought forward. In "Scientific Progress" everything of general interest to the scientific world has been noticed, and placed in such a shape as to be comprehended by any one. In the "Useful Information" column items of information on every conceivable subject have been gathered; and "Good Health" has been the title bead to many articles of value and benefit to both the well and sick. The "Engineering" department which was established this year has enlisted many new readers, and we have endeavored faithfully to collate for it only such matter as would be useful and interesting to Pacific coast readers.

We are pleased to say that our correspondence page has been well filled this year and has often run over its proper boundaries. The correspondents of a paper, especially a technical journal, give it great value, and we are pleased to number among those who have contributed to our columns many intelligent men well posted on what they write.

We have each week given the list of patents granted to Pacific coast inventors, and described in detail, or illustrated, those which seemed of more general utility than common, or more adapted to the wants of the industrial classes. Our index gives in brief form a list of all the inventions patented by Pacific coast inventors during the past half year. We have also devoted considerable space of late to news matters, giving all the latest news in a condensed form. We have besides given "Items of Interest from the Mines," compiled from official sources, which give briefly such news of importance from prominent mines as does not appear in the "Mining Summary." Among other things of which we may be said to have made a specialty, is that of mining law. We have carefully watched legislation, either State or National, and given the views of the mining public on these questions. We have given in full all new laws or mining decisions, and kept track of every change which has occurred. We have been at great trouble to answer plainly and clearly such questions as have been propounded to us on matters pertaining to the mining laws, and flatter ourselves that we have been uniformly correct. The paper has no doubt been of great benefit to many working mines in this matter alone.

In this volume will be found, as in previous ones, the full proceedings of our local Academy of Sciences as well as many of the more important papers read before that body. The volume also contains a very full and comprehensive account of the exhibition held this year under the auspices of the Mechanics' Institute. We gave the opening exercises, speeches in full, the list of exhibits, of awards, etc., and described in detail all of the more important exhibits and characteristics of the exhibition. Many of the articles there shown were illustrated in this journal, and the volume gives a complete history of the fair.

As great attention has been turned towards Arizona this year we have been careful to obtain all the reliable information possible from that part of the country and have published a great deal concerning it. Another subject of interest has been the working of dry placer mines, and we have described in detail the various machines intended to work such mines. The Comstock, to which renewed attention has been called, has received a large share of notice, and beside the weekly summary of mining news from there, we have published everything of general interest connected with the working of the mines. We have kept watch also on our foundry interests and described from time to time the new machinery they were making for mining or other purposes, and whatever was new or of interest in that line. Feeling, moreover, that everything that tends to build up home manufactures is good for the community, we have given full notice of everything of the kind that has been established. Our readers have had in a condensed form a number of articles descriptive of the results achieved by the geological survey of the Territories to which subject we have paid special attention. The series of articles on "Hydraulic Mining in California," from the pen of Mr. Bowie, a scientific as well as a practical hydraulic miner, renders this volume particularly valuable. It may be said here that the articles really comprise a treatise on the subject, the best yet written. They have been profusely illustrated and give every possible detail in connection with this important industry from the inception of an enterprise to the productive results. The tables showing the results of practical work are especially valuable and the whole treatise will serve as a guide either to the investor or the practical miner. Mr. Bowie deserves the thanks of the mining community for compiling so skillfully and intelligently so many scattered facts and freely giving the results of his own wide experience through the columns of the PRESS.

Space will not admit of our giving any further resume of the contents of the volume, but the index will speak for us. We have aimed in our editorial columns and in the whole paper to give as much information on as great a variety of subjects as possible. When abuses in mine management have been apparent we have not hesitated to denounce the perpetrators, and where controversies have occurred we have consistently upheld the cause of the working miner and the mechanic. The MINING AND SCIENTIFIC PRESS is devoted to the interests of the industrial class, and being under the guidance of no clique or ring has been free to express itself as it chose.

We have naturally endeavored to make the paper as interesting and valuable as possible to our readers, for it is for our mutual interests to do so. The paper has, now survived its eighteenth year of usefulness, and in its prime. Many of our subscribers have been with us from the first, but we have gained new friends from year to year. The circle can still be widened, however, and with it our field of usefulness. Those who know the merits of the PRESS can bring it to the attention of new comers and aid us in a practical way. The end of the volume is a fitting time for old subscribers to renew and for new ones to send in their names and their money. Nothing in this or any other country can be run successfully without ample funds, and we aim to improve as the country improves. In fact we are ambitious to keep a little ahead, and we hope our readers have enough pride in the only technical journal on the coast to give it every assistance in their power. Our advertisers are the best among the business men of the community, and our readers are mainly hard-handed but intelligent miners and mechanics. Their continued assistance we deem a just due for the labor bestowed to uphold their interests and furnish information of value to them. New ones are always welcome, the more the merrier, and the sooner the better. Every miner and mechanic of progressive tendencies on this coast ought to take the PRESS, and the quicker they who are not now subscribers, become so, the more advantage it will be them.

## A Prosperous Mine.

It is not often that one has an opportunity of chronicling the fact of a mine having paid 100 consecutive dividends. In fact, we do not remember having ever done so until now, in making an abstract from the report of the Idaho mine, at Grass Valley, Nevada county, California. The mine this month declared its one hundredth dividend, aggregating 734 1/2% of the original stock of the company, or in all \$2,270,750.

This mine is one that has been, and is, legitimately worked for what is in it, and is not carried on as a stock speculation. It is not known at the Stock Exchanges, which is probably one reason why it has been so uniformly prosperous. The annual meeting of the company was held in Grass Valley on the 17th inst., and the local papers publish the reports of the officers in full, from which we make some extracts.

The Superintendent, Mr. Edward Coleman, says that the past year has been one of average prosperity, and although they have not met with any very high grade ore they have still had a constant supply that has given a fair return and enabled the company to pay a \$5 or \$7.50 dividend every month. The ore in sight

is good and the mine in good condition, so the Superintendent sees no reason to expect any material falling off in yield or dividends. The drifts are well ahead of the stopes, and several years' work may be expected from the ore in sight and what may reasonably be expected from below the 1000-foot level. The main shaft is down to the 1000-foot level and the pump shaft to the 800-foot level. The Superintendent says:

In view of the rapid pitch of the pay chute from the main shaft, and the large amount of dead work that will have to be done in order to open another level from the shaft, it is deemed advisable for the working of the mine below the 1000-foot level to sink an incline from this level and follow to pay chute down; and for this object we are now opening up a station to fix the engine, and have already ordered a compressor to supply the air as the motive power.

The total depth of the present workings in the mine is 991 feet perpendicular. This gives an incline following the ledge of 1,076 feet; and as our main shaft is on an incline this should be considered the full depth of our 1000-foot level—and below this point nothing has been done.

During the year we have crushed 29,250 1/2 tons of ore; of this amount 1,254 1/2 tons came from the 500-foot level; 1,518 1/2 tons from the 600-foot level; 5,537 1/2 tons from the 700-foot level; 9,289 1/2 tons from the 800-foot level; 10, 149 tons from the 900-foot level, and 1,502 1/2 tons from the 1000-foot level. This gives a yield of

28,925 1/2 oza. bullion, value.....	\$508,138.20
Sold 108 tons of sulphurates.....	6,498.10
Paid \$20 per ton for working.....	2,102.00
Specimens.....	1,950.04
Total yield of tailings.....	11,390.45

Total yield from ore.....\$530,143.69  
Giving an average of \$18.12 1/2 per ton.

I again have to report that all business connected with the company affairs in a satisfactory condition, and, except the compressor now ordered, I know of nothing that is likely to occur requiring any outlay of money more than the usual expenditures required for milling, mining and keeping the works in proper repair.

The total expenditures of the mine for the year are shown in the following table:

Mill and mining.....	\$257,658.00
Saving sulphurates.....	2,921.00
Grinding tailings on percentage.....	1,798.25
Compiling main and pump shaft.....	10,072.35
Repairing shaft.....	4,332.83
General account.....	9,265.00

Total expenditures.....\$284,140.99  
The cost of milling and mining per ton was \$8.91.

The Secretary, Mr. Geo. W. Hill, reports that at the commencement of the fiscal year there was a balance in the treasury of \$20,165.31. The receipts from all sources for the year were \$525,435, to which add the balance on hand December 4th, 1876, of \$20,166.31, making the amount for the year \$545,601.40.

The total expenses, including 12 dividends, for the year were \$524,396, leaving a balance in the treasury of \$21,205.40.

To the foregoing monthly expenditures are included 12 dividends declared for the year herein stated and at the time and amounts as follows:

No. div.	Declared.	Per cent.	Amt.
89	Jan. 1, 1877,	7 1/2	\$23,250
90	Feb. 5, "	7 1/2	23,250
91	March 5, "	7 1/2	23,250
92	April 2, "	7 1/2	23,250
93	May 7, "	7 1/2	23,250
94	June 4, "	7 1/2	23,250
95	July 2, "	7 1/2	23,250
96	Aug. 6, "	5	15,500
97	Sept. 3, "	5	15,500
98	Oct. 1, "	5	15,500
99	Nov. 5, "	5	15,500
100	Dec. 3, "	5	15,500

Being for the year 77 1/2% upon the capital stock and amounts to.....\$240,250

The following tables show the aggregate receipts and expenditures of the company for the past nine years, that being the period in which the mine has paid dividends, and before which only prospecting was done. Receipts from all sources for the fiscal years:

1869.....	\$306,038.75
1870.....	183,450.23
1871.....	407,301.16
1872.....	404,035.52
1873.....	1,010,612.20
1874.....	669,023.03
1875.....	509,430.72
1876.....	573,028.31
1877.....	525,435.00

Total receipts for nine years.....\$4,589,255.01

There has been paid out in dividends to the stockholders as follows:

1869 11 divs. aggr. 55 per cent.....	\$170,500
1870 7 " " 12 " ".....	37,200
1871 12 " " 12 " ".....	232,500
1872 11 " " 52 " ".....	109,750
1873 12 " " 220 " ".....	682,000
1874 12 " " 102 1/2 " ".....	317,750
1875 11 " " 55 1/2 " ".....	172,050
1876 12 " " 82 1/2 " ".....	255,750
1877 12 " " 77 1/2 " ".....	240,250

Total.....\$2,270,750

This makes 732 1/2% of the capital stock paid in dividends, a showing that very few mining companies can make, here or elsewhere.

THE rainfall in San Diego up to the 24th inst. amounted to 4.50 inches for the season. Rain fell on Christmas day. The rivers are rising all over the southern section of the State and in Lower California.

TWO HUNDRED men completed the repairs of the Southern Pacific road, between Dos Palmas and Volcano, on the 20th.



### The Necessity for Home Manufactories.

The only way that California can be made to be the prosperous State that she was before the railroads brought her into direct competition with the East, is to have work for everybody as there was then. And the only way to give everybody work is for our capitalists to stop speculating and lending money and start up home manufactures. The trouble with us now is that we have more people than we have work for. We have not enough manufactories. We buy too many things abroad that we could make as well or better at home, and still we wonder why "hard times" visit us and stay so long.

Another thing is we want too much for our money. People who have it expect it to earn its own per cent. at least, simply by loaning it. Those who would establish manufactories if they could find it possible to do so and pay the rates of interest charged. Again, some of them say, "We must put up \$20 in silver as security for \$20 in gold." No matter how much land a man has or how good it is he finds it next to impossible to borrow any money on it if it is in the country. And if he does succeed in raising anything on it they will not lend more than a quarter of its value.

There has got to be a radical change in our manner of doing business on this coast, or things will go from bad to worse. No man can make a manufacturing business pay when he has to hire money to carry it on at a cent or cent and a half a month. And not only that, he

precarious existence in any way, so they evade real work, must take off their coats, turn up their sleeves and handle the hoe or the plow, the hammer or the plane, or they must leave this country for some other—if they can find one—where there is more room for them than here. Work, real earnest, hard work is what the Pacific coast community must come to if they would be prosperous. The cities are filled with idlers who should be tilling the fields or working the mines, and rich men who are money lenders instead of producers. People can ill afford to borrow money as rates now stand, and these men must establish manufactories to invest their money or keep it unproductive in their hands.

The times are ripe for change, and change there must be. With more manufactories there will be more opportunity for labor. As each man's arm becomes productive prosperity will rule among us once more, and California resume the proud position to which she is so well adapted. Her geographical position, climate and other natural advantages are in her favor, but her people must do their share in the good work to make her the most prosperous State in the Union.

### Patents for Mining Claims.

Following is a complete list of patents issued for Pacific Coast mining claims since last report:

California—Nevada county, South Yuba Canal Co., for Chicken Point and Smith, Powell and King placer mines; Bernhard Hysink, Emigrant placer mine; Henry P. Connor, North

### An Improved Boiler Feeder.

The Hancock Inspirator, illustrated on this page, is an apparatus for feeding water to steam boilers, for filling tanks and for any purposes for which a pump may be used in hauling water. It has no movable parts at all, but is a double apparatus, one-half of which is a lifter and the other half a forcer, the lifter drawing the water from any ordinary depth and delivering it to the forcer which delivers it to the boiler at any steam pressure without adjustment. An ordinary injector in a single apparatus, cannot lift water over five or ten feet and requires adjustment for varying steam pressures. The machine lifts as high as any pump and delivers it to the boiler, with very little steam pressure. It has lately been introduced on this coast by Parke & Lacy, 417 Market street.

The inspirator differs materially, both in its construction and working qualities, from the class of boiler feeders known as injectors, inasmuch as it has one set of tubes for lifting and another set of tubes for forcing water, a combination entirely new, reliable and efficient. There being no movable parts in its internal construction it requires no oiling or adjusting to various pressures or lifts, which is necessary with other pumps.

Fig. 1 is a section showing the construction of the inspirator, and Fig. 2 is a perspective view of a stationary one. Fig. 3 shows the locomotive inspirator made on the same general

### Mine Investigation.

A committee composed of Augustus Waterman, James Biddulph and W. L. B. Mills was appointed at a meeting of the Advance silver mining company, on the 15th of last month, to examine the company's books and accounts. Majority and minority reports have been prepared, the former signed by Mills and Biddulph and the latter by Waterman, who was chairman. The majority report sets forth that the statement made in Mr. Waterman's report, in regard to the receipts by the company for stock sold, is entirely at variance with the facts as apparent in the books and accounts of the company.

Waterman, in this minority report, says he has been able to obtain the following summarized information from the books of the company: "8,636 shares, as per books of the company, sold for \$26,108; 6,465 sold, as per books on file in court, for \$27,000, and 4,014 for \$37,000, being a total of 19,135 shares known to have been sold for \$90,108, thus leaving unaccounted for 12,666 shares, which, at \$2.50 per share, the lowest price the stock sold at, would be \$31,665, or a grand total of 31,801 shares for \$121,773. This gives an average price of only \$4 per share, which is, in my opinion, below the real average. If the stock sold was, as represented, working capital, the company should have been credited with \$121,773, instead of \$58,447.50. If, on the contrary, it was not working capital, the stockholders have been de-

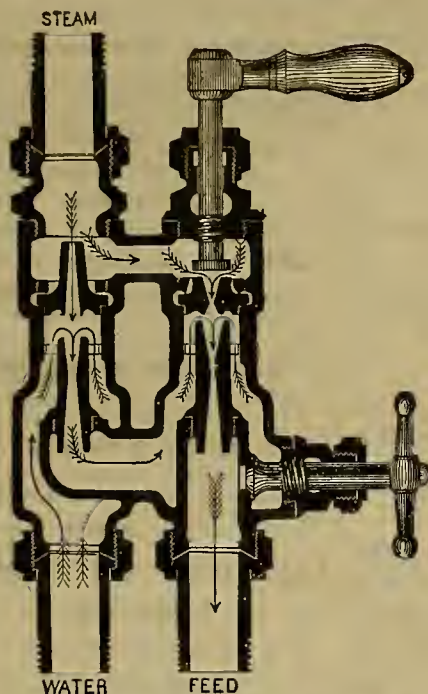


FIG. 1. SECTION OF HANCOCK INSPIRATOR.

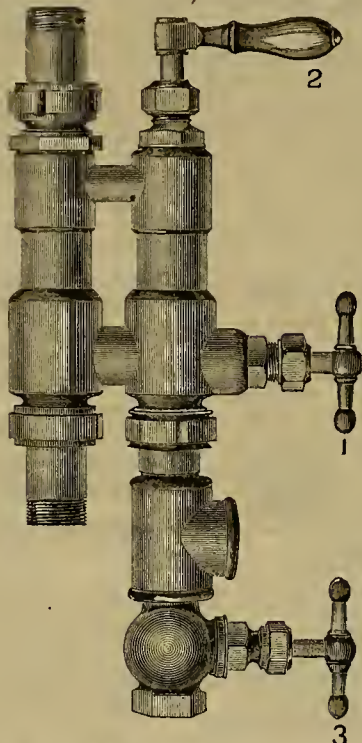


FIG. 2. THE HANCOCK INSPIRATOR.

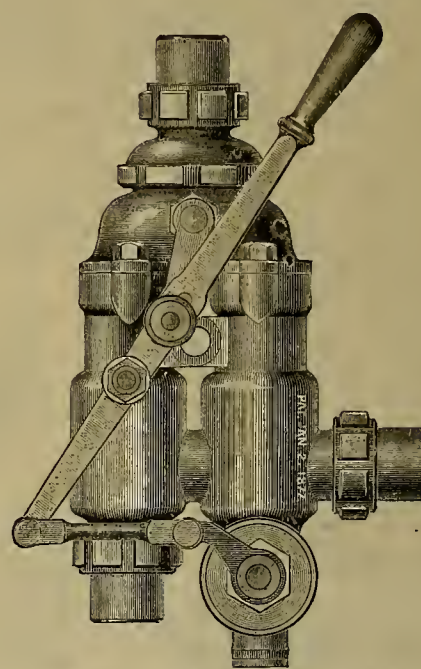


FIG. 3. INSPIRATOR FOR LOCOMOTIVE BOILER.

finds it difficult to get money at any price to establish anything new, such is the disinclination of our moneyed men to enter the manufacturing field.

"Cent per cent" has been our bane and still continues. As soon as a man gets a little money he knocks off work, sits him down, and expects his money to do the work for him, and he stops his work so soon that he wants a small amount to yield a large one, and charges his rate of interest accordingly. It is all very well to say you can get money in San Francisco for seven or eight per cent., but let any one try it at the banks and offer anything as security less than a first-class piece of city property and see how he succeeds. And then let him try to borrow from a private individual and see what success he meets in that direction.

There is not the slightest doubt but that this habit of collecting high interest has done more harm in California and kept it back more in every sense, than any railroad monopoly, Chinese immigration, land-grabbing schemes, Mexican grants, or any other grievance of which we have complained. When one-quarter of the people want to live on interest paid by the other three-quarters, and that one-quarter spend more than the others earn, the result is not satisfactory and the state of affairs cannot last long.

We must all go to work. There is no use in putting off the issue any longer. The non-producers in our midst are too many and with them no country can be prosperous. The thousands who want to make their living from stock speculations must quit this precarious trade and work in the mines. Those who stand between the producers and consumers must perforce become producers as they are already consumers. The men who hold large tracts of land at prices no real farmer or border could afford to pay, must sell these lands to men who will cultivate them and must assist them in so doing. The thousands of idlers in our cities, who eke out a

Bonner quartz mine; Robert McMurray, placer mine; Yuba Gravel Range Co., placer mine. El Dorado county—Matthias Seeley and others, Grizzly Gulch placer mine; Adolph Wenzee, Bean Hill placer mine; Geo. W. Swan, Eastern Buckeye; Carrie Halle Hydraulic, Mining and Water Co., Trinity and Succor and Christian placer mines. Butte county—J. B. Haggin, '49 and '56 quartz mine.

Nevada—Eureka county, Adams Hill Mining Co., mineral, Lee, Line, Joseph Ringot, Hulucott mines; Silver West Co., mill-site. Lander county, Henry L. Byrne, DeFrance; Eagle Silver Mine and Mill Co., Monitor and Eagle mines. White Pine county, P. L. Weaver, King lode; Newark Co., Buckeye, State and Lincoln mines.

Utah—R. B. Chisholm, assignee of Elgin Chieftain Mining Co., Chieftain lode; Jersey Co., Jersey mine; R. C. Chambers, City Rock mine; Isaac S. Waterman and others, Severe and J. W. Cootey mines.

Pacific Coast miners will remember that Dewey & Co., this office, are now fully prepared to procure patents for mines, expeditiously and cheaply, and will furnish information on the subject to those desiring it.

**BULLION SHIPMENTS.**—Since our last issue shipments of bullion from the prominent mines have been as follows: Con. Virginia, Dec. 19th, \$152,495.58; California, 19th, \$235,655.49; Northern Belle, 17th, \$3,139.55; Grand Prize, 21st, \$11,700; Alps, 19th, \$1,627; Gila, 16th, \$95.67; Alps, 21st, \$9; Con. Virginia, 22d, \$173,692.34; California, 22d, \$116,569.77; Northern Belle, 19th, \$2,971.22; Northern Belle, 22d, \$4,260.83; Arizona, 20th, \$1,050.51; Standard, 21st, \$33,558.27; Tybo Con., 17th, \$4,384.14; Alps, 22d, \$2,631; Alps, 24th, \$2,074; Grand Prize, 24th, \$12,900; Tybo Con., 21st, \$4,235.22; Martin White, 25th, \$20,900; Alps, 26th, \$2,109; Gold Hill (Idaho), 26th, \$17,600.

principle but varying slightly in detail, being operated by a single lever. It is claimed that this device will start at a lower pressure than any pump, thereby obviating the necessity of moving a mass of machinery for running a power pump, or raising sufficient pressure for running a steam pump if necessary to fill the boiler when the machinery is not in operation, thus making a saving in fuel and wear and tear of pumps, etc., as only a small head of steam need be kept up. The conditions for its certainty of working are: First, an air-tight suction; second, an abundant supply of water with a lift not exceeding 25 feet, and a temperature not exceeding 120° Fah. for a low lift and 100° for a 25-foot lift. No adjustment is necessary for varying steam pressures. It can be started at a low lift at five pounds pressure and will continue to work without any adjustment up to any pressure allowed by law. The advantage of this peculiarity of the Hancock will be evident to engineers. The inspirator is intended for stationary boilers, locomotive boilers, for use at watering stations on railroads, for mining purposes, as a hinge pump, for emptying or filling tanks in buildings, as well as for general pumping purposes. Further details are given in the circulars, which will be sent on application to the above address. These machines are meeting with great favor in the Eastern States, but have only now been introduced here.

The Treasury now holds \$346,277,540 to secure National Bank circulation, and \$13,985,000 to secure public deposits. United States bonds deposited to secure bank circulation for the week ending last Saturday amounted to \$802,000; amount withdrawn, \$118,000; National Bank circulation outstanding—currency notes, \$320,233,765; gold notes, \$1,432,120.

The English government is taking an account of its stock of war material.

ceived when it was represented to them that it was, and that the proceeds would be used in developing the mine.

A meeting of the dissatisfied stockholders of the Modoc mining company has been held. A report of the committee appointed at a previous meeting to inquire into the affairs of the company was read by the Secretary, Captain Mullett. The President, J. W. Coleman, had given them permission to examine the books and the employment of experts for that purpose was recommended. Several stockholders urged a speedy and thorough examination of the affairs of the mine. It was suggested that while they were about it they might find out whether the dividend paid last January, under Pearson's management, came from profits or assessments. Much dissatisfaction was expressed with the present management. It was finally voted to employ experts to examine the books, the expense to be defrayed by the dissatisfied stockholders at the rate of one dollar for each person holding less than 100 shares, and one cent per share for all having more than that number. Ten thousand shares, or one-tenth of the total number, were represented at the meeting.

The Justice investigating committee have not concluded their labors, but the Virginia Chronicle asserts that the mine has paid \$161,064 above expenses in the last two years, notwithstanding which assessments have been levied aggregating \$2,152,000. If to the amount of assessments the bullion yield be added, the total amount of money to be accounted for cannot fall much below \$5,000,000. A pretty state of affairs!

BUSINESS was generally suspended throughout the coast on Christmas day, and the day was appropriately celebrated, religiously and socially.

The internal revenue collections in this district last week amounted to \$24,064, and the total since January is \$2,002,878.



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## BUSINESS DIRECTORY

OF THE

Pacific States and Territories

For 1878.

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Devoted to but one well defined work, we are gathering around us the youth of loftier minds and purer aspirations, such as are seeking a higher education. We are protected, naturally, from that class of students who are sent to school to escape the House of Correction. The Principal and Faculty respectfully solicit a fair investigation from intelligent parents and earnest students.

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## TAXES.

1877-1878.

Notice is hereby given, that a certified copy of the Assessment Book of the Taxable Property of the City and County of San Francisco, Real Estate and Personal Property (Subsequent Assessment Book included), for the Fiscal Year 1877-78, has this day been received; that the State, City and County TAXES for said fiscal year are now due and payable at the office of the undersigned, Room No. 1, City Hall, and the Laws in regard to their collection will be strictly enforced.

Taxes will become delinquent on the FIRST MONDAY in January, 1878, and unless paid prior thereto, Five per cent. will be added to the amount thereof.

WM. FORD,

Tax Collector of the City and County of San Francisco.

SAN FRANCISCO, October 22, 1877.

## Montgomery Avenue Tax.

Notice is hereby given that a certified copy of the Assessment Book of Real Estate, which is subject to Assessment to defray expenses incurred by the opening of Montgomery Avenue, has this day been placed in my hands to collect Taxes thereon.

Said Taxes are for the Fiscal Year 1877-78, and are now due and payable at the office of the undersigned, Room No. 1, City Hall. All Taxes remaining unpaid on the FIRST MONDAY of January, 1878, will have Five per cent. added thereto.

WM. FORD,

Tax Collector for the City and County of San Francisco.

SAN FRANCISCO, October 22, 1877.

## ASSESSMENT OF LANDS

Benefited by Widening Dupont St.

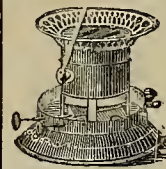
Notice is hereby given, that a certified copy of the Assessment Book of the Real Estate which is subject for the payment of Principal and Interest upon "Dupont-Street Bonds," as directed by an Act of the Legislature of California to authorize the Widening of Dupont Street in the City of San Francisco, "Approved March 23, A. D. 1876," has this day been placed in my hands for collection. The Laws in regard to the collection of the same will be strictly enforced.

WM. FORD,

Tax Collector of the City and County of San Francisco.

SAN FRANCISCO, October 22, 1877.

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### JOHN L. BOONE,

**Attorney and Counsellor at Law,**

**PATENT LAW A SPECIALTY.**

OFFICE—202 Sansome Street, N. E. corner Pine Street, San Francisco.



## Musical Instruments.

The firm of Kohler & Chase, of 633 and 635 Clay street in this city, is an old established and trustworthy house, dealing in pianos, organs and all other kinds of musical instruments. They are extensive importers of instruments and instruction books, and have long held an enviable position in this branch of trade. We take pleasure in recommending them to all our readers who wish to introduce the refining influences of music to their homes. The firm make a specialty of the Decker Brothers' piano, the Mason & Hamlin cabinet organ, the Emerson piano and the J. & C. Fischer upright piano. All of these instruments have gained a wide fame for excellence and won high praise from those who know best what constitutes excellence in a musical instrument.

We would speak especially at this time of the Decker Brothers' piano. We cannot do better than present a testimonial of its quality, freely given by a group of musicians whose praise will commend itself to all music lovers. During the Centennial there was held in Philadelphia a grand musical congress, at which the Decker Brothers' instruments were used, and the result was the following straightforward endorsement:

PHILADELPHIA, June 27th, 1876.  
The Decker Brothers' Grand pianos, used by the Musical Congress at their grand operatic concerts and musical festivals, recently given at the American Academy of Music, were remarkable for their superior quality of tone and extraordinary power. Finer instruments we never heard. Clara Louise Kellogg, Annie Louise Cary, Zella Seguin, Julia B. Rive, Esmeralda Corvautes, Joseph White, Max Marotzek, P. Brignoli, S. B. Mills, P. Ferraui, Franz Remmert, E. Behrens.

A matter which we would make most prominent in this connection is, that the Decker Brothers' name is the subject of attempts at counterfeiting. This is the penalty which the manufacturers of a first-class instrument have to pay for the gaining of a good name, and all our readers should be on their guard against imposition. Unprincipled parties have manufactured and sold cheap pianos under the names of "Decker," "Decker & Co.," "Decker & Brothers," "Decker Brothers," etc., doing business on the reputation and popularity of the celebrated Decker Brothers' pianos. All genuine Decker Brothers' pianos have their name in front on the pianos above the keys, viz.: Decker Brothers, New York. In all genuine Decker Brothers' square pianos the following words appear, cast upon the iron plate on the inner left-hand side of the instruments: Decker Brothers' patent, June 21, 1863.

The simplest way to guard against imposition is to deal with those who are well known to be trustworthy. Kohler & Chase have a reputation of this character established by twenty years of business experience in this city.—*Pacific Rural Press*, Nov. 1st, 1877.

## The Best and Most Popular Pianos

—ARE THE—

## DECKER BROS'.,



The EMERSON and

The FISCHER Upright

## A GREAT OFFER.

WE WILL SELL THE MAGNIFICENT

DECKER BROS'., Square No. 2 for \$525, - Catalogue Price, \$660.

AN EMERSON Square No. 2 for \$400, - - Catalogue Price, \$550.

A FISCHER Upright C for \$400, - - - Catalogue Price, \$725.

OTHER STYLES EQUALLY LOW.

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Kohler & Chase, Agents,

633 and 635 Clay Street,

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The Largest and Oldest Music House on the Pacific Coast.

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A Book for all That Have a Garden.

## FRAGARICULTURE;

—OR THE—

## Culture of the Strawberry.

A PRACTICAL TREATISE ON

Culture, Propagation, Management and Marketing of Strawberries. 1878.

Illustrated with Photographs, representing the average size of best varieties. Especially adapted to the Family Garden.

BY FELIX GILLET, Nevada City, Cal.

### TABLE OF CONTENTS.

Fragariculture; Description; Varieties; Selection; The Soil; Preparation of the Soil; Manures; Time of Setting Strawberries; Setting out Strawberries; Culture in Rows and Hills; Matted Row System; Mulching; Irrigation; Care of Plants after Setting; Propagation; Propagation by Seed; Resetting; Exposure; Annual Varieties; Biennial Varieties; Ever-bearing, or Wood Varieties; Bush-alpine Varieties; Staminate and Pistillate Plants; Hybridization; Forcing Strawberries; Care to Plants Forwarded by Mail; Duration of Strawberry Beds; Mode to Perpetuate Strawberry Beds; How to make Strawberries Last; Spring Work on Strawberry Beds; How to Raise Very Large Fruit; How to Pick and Keep Strawberries; Packing and Shipping; Insects Injurious to Strawberries; Maladies of the Strawberry; The Art of Preparing Strawberries; Preserving Strawberries; Medicinal Properties of Strawberries; General Hints on Fragariculture; Explanation of Photographs, and list of best varieties.

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Each photograph represents a group of strawberries—three to five—and not a single one, and is six inches by four inches.

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A competent person is desirous of receiving the position of Superintendent of a Smelting and Refining Works. Can give satisfactory reference for ability to smelt all lead ores, refine silver and make market lead. No objections to go to the Territories. Address P. F. M., this office.

25 ELEGANT CARDS, no two alike, with name, 10 cents, post. paid. J. B. HUSTED, Nassau, N.Y.



Among the advantages gained by this holder are the following:

It can be opened and closed quickly. The points are less obstructed while the articles to be filed are being placed.

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## Mining Suits and Decisions.

A complaint has been filed in the Fourth District Court against the Alta mining company, to have a deed recently made by the Justice mining company set aside, on the ground that it was obtained by bribery and fraud. The complaint alleges that the Schultz-Justice party conspired with certain parties to obtain a portion of the Justice mining grounds, and in order to do this gave to the Alta mining company a deed to a portion of the ground, for the ostensible purpose of avoiding litigation about the portion of ground to which the Alta company set up a claim. The complaint further sets forth that while the Schultz party claimed to have made the deed without monetary consideration, the deed was given in consideration of \$200,000. The complaint concludes with a prayer that the Alta mining company be required to reconvey the property to the Justice mining company.

In the case of Kitz et al. vs. the Lady Bryan mining company, Judge Wheeler has decided in favor of the company and ordered the dissolution of the injunction granted a year ago restraining defendant from selling delinquent assessment stock. He explained that the plaintiffs claimed that as the Trustees had not fully collected assessment No. 13 it had no right or authority to levy another assessment. It had, however, been shown in evidence that there was an injunction on assessment No. 13 when the last one was resolved upon, and that the law gave the Trustees power to do this. While the management of the mine was not such as to excite the moral admiration of the court, it could not interfere with the actions of the Board so long as no law had been violated. The Board had full discretionary power, and if persons bought stock in the mine they were, of course, bound to abide by the decision of the Trustees.

In the Exchequer pool case Judge Morrison has decided that C. E. Brooks need not answer questions as to the amount of capital he brought with him to this city, which were put to him by the referee in the suit of Henry S. Tibbey vs. John Leighton, the manipulator of the Exchequer pool. He thought that the inquiry was too broad, and involved many matters which could not be investigated in this proceeding. Brooks could only be questioned respecting property in his hands, or credits belonging to the defendant in the attachment suit. When he denied having any property in his possession, or under his control, belonging to the defendant, but claimed such property in his own right, he was entitled to have the matter tried by a jury, and could not in this summary manner be compelled to deliver such property into the hands of the Sheriff.

## News in Brief.

THE city hall at Portsmouth, N. H., was burned on the 20th.

STANLEY is on his way home from Africa. The siege of Erzeroum is to be commenced shortly.

THE Vallejo bank, which suspended last year, is to resume business on January first. The total Russian loss by the war to December 20th, is \$8,412 men.

THE Porte has issued a proclamation deposing Prince Milan of Serbia.

ARIZONA is having a good deal of trouble with highway robbers.

THE Cretan insurgents are forming a National Assembly.

J. B. PIER, owner of a large fleet of bay schooners, died in this city this week.

HENRY PINCHBECK, the architect and builder of Manchester, has failed. Liabilities \$540,000.

IT is said that the Porte will shortly order a fresh army of 300,000 men.

THERE were 105 deaths in the city last week, or 23 less than the previous week.

THE famous trotting mare, "Flora Temple," is dead.

THE jury on the Low will case disagreed and it will have to be tried all over again.

TULARE LAKE is now down 13 feet below high water mark, and Root island is a part of the main land.

ADOLF BIRGHAM, of the firm of Fenisier & Birgham, commission merchants in this city, has committed suicide.

IN consequence of a proposed reduction of wages after the holidays, 1,000 ironworkers at Sheffield have struck.

IT is proposed to mold a fountain and statue of George Washington at the junction of Washington square and Powell street in this city.

A BILL is pending in Sacramento, which proposes to regulate the prices and quality of gas in this city.

THE California & Nevada Meat Shipping Co. have commenced shipping meat to this city in refrigerator cars.

THERE is a movement on foot in Chicago to establish a mining stock exchange to deal in California shares.

THE Union Pacific rolling mills at Laramie are a work on 8,000 tons of iron rail for the Utah Northern.

GOLD excitement continues regarding discoveries in Cariboo, and business is very brisk at Victoria.

THE amount of deposits in the saving banks of the United States is estimated at \$1,500,000,000.

ALL our interior exchanges represent the farmers to be in good spirits over the recent rains.

THE town house and Winthrop church at Holbrook, Mass., were burned on the 25th.

GENERAL ESCOBEDO says there is no ground for trouble between this country and Mexico.

DURAND, President of the French Council, has ordered proceedings begun in regard to electoral offences, that offenders cannot plead delay in instituting prosecutions.

MILLEN McCULLOUGH, a young man well known in Yuba City, mortally wounded Charles Finn in a fight on Christmas eve in that place.

A FIRE at Stayton, Marion county, Oregon, destroyed \$7,000 of property on the 21st. Hobson & Whitney were the losers, but have covered \$5,000 with insurance.

IN an address before the Paris Academy of Sciences, De Lesseps stated that the probable cost of a Darien ship canal, on the line advocated by him, at 600,000,000 francs.

THE hands in the Pennsylvania railroad shops at Altoona are just finishing an order for 63 engines cabs, to make good the number destroyed at Pittsburg during the riots.

BY an explosion and resultant fire of a candy factory in New York on Friday last, some 40 lives were lost, principally boys and girls. The company's loss was \$450,000.

GENERAL SHERIDAN has been notified of the Secretary of War's approval of the final survey of the military road from Bismarck to the Black hills.

MR. J. C. FLOOD, of the bonanza firm, distributed \$7,000 on Christmas among the orphan asylums and benevolent societies.

THE two bonanza mines, California and Consolidated Virginia, have paid 40 \$1,080,000 dividends in the past two years. The total is \$43,200,000.

THE Sutter street railroad company reduce the fare on all their lines on the first of January to five cents. The other lines will have to follow suit.

EXCISE COMMISSIONER OWEN MURPHY, of New York, has absconded with about \$30,000 to \$40,000. He is supposed to have sailed for Europe.

THE party of raiders who recently went through the town of Caliente, were put in jail after being caught. The citizens took the five men from the jail and lynched them.

IT is said a London manufacturer of military stores, who had large orders on hand for Russia and Turkey, have received notices of cancelling them.

NO special preparation is going on at the Woolwich (England) arsenal, except the manufacture of field guns. Only 4,000 hands are employed. The war force is from 10,000 to 12,000.

GREAT distress prevails among the poor of Constantinople. The prices of provisions are rising in consequence of the depreciation of the currency, and difficulties are feared if the price of bread rises higher.

THE bill recently passed by the Legislature to submit to the people of this State at the next election the question whether they favor the presence of the Chinese among us, has been signed by the Governor and become a law.

A Herald London special says: The matter of rapid transit in New York is settled. An English syndicate is to build the road, which is to be underground. Work will begin immediately. The road is expected to cost from \$6,000,000 to \$8,000,000.

AS the question of subsidizing mail steamship service will be one of the subjects to be considered by Congress at the present session, an effort will be made to have inserted in any bill which may be passed granting a subsidy, a claim compelling the company to have its vessels manned by American seamen.

THE Ohio Agricultural College will begin in January a course of special lectures to practical farmers—a large number of whom have asked for such lectures. A tuition fee of \$5 will be charged, simply to cover the actual expense of the lectures.

THE Alsace and Lorraine Provincial Committee has passed a resolution expressing a wish that Alsace and Lorraine should receive its own Constitution as a Federal State, and to have a representative in the Federal Council of the German Empire.

THE work on streets projected by the old Board of Supervisors, and which was not commenced, has been abandoned, the contractors perceiving the necessity of either submitting to that plan or going without pay.

IT has been decided by the Directors of the Hibernia savings bank to postpone the erection of a new building on their lot on the corner of Post and Montgomery streets, and to remodel their present building and that adjoining on Montgomery street.

THE Massachusetts Savings Bank Commissioners have enjoined the Taunton savings bank from doing further business. The bank has \$1,404,515 assets, with \$1,353,763 liabilities. The weak condition of the bank is due to the depreciation of loans on mortgages.

AN official telegram states that a sudden drifting of the ice on the Danube has torn away the bridge at Ibrai. A Russian steamer is frozen in and is unable to approach the bridge. Grand Duke Alexis announces that communication cannot be restored for the present.

Le Temps, alluding to a report that active intercourse has been going on between Paris and London with a view of establishing an understanding on the Eastern question, says: It is perfectly certain that the French government does not intend departing from its attitude of reserve to play an active part in Eastern affairs.

## PATENTS AND INVENTIONS.

## List of U. S. Patents Issued to Pacific Coast Inventors.

[FROM OFFICIAL REPORTS FOR THE MINING AND SCIENTIFIC PRESS, DEWEY & CO., PUBLISHERS AND U. S. AND FOREIGN PATENT AGENTS.]

By Special Dispatch from Washington, D. C.

WEEK ENDING DECEMBER 27TH.  
BOOKS FOR CARRYING FISHING FLIES.—Henry H. Holt, Kalama, W. T.  
PISTON WATER METER.—Alvah C. Austin, Oakland, Cal.  
RAILWAY AIR BRAKES.—N. W. Green and G. W. Hoag, of San Jacinto, and T. C. Cleveland, of Mountain House, Cal.  
ORE ROASTING FURNACE.—E. G. Hall, Healdsburg, Cal.  
WINDMILL.—R. R. Lander, Turlock, Cal.  
LIGHT WEIGHT ROPE.—A. D. Ledy, S. F.  
HARVESTER.—Samuel Spencer, Turlock, Cal.  
WELL BORING MACHINE.—W. F. Vaughn and S. Jackson, Stockton, Cal.  
COMBINED RAILWAY AND CONDUIT.—J. B. Ward, S. F.  
GARDEN VALVE.—V. Kingwell, S. F.

TRADE-MARKS.  
OYSTERS.—Haas Bros., San Francisco and New York.  
PULVERIZED SUGAR.—Chas. J. Hawley, S. F.  
PACKED AND PRESERVED FISH AND MEATS.—J. O. Nanthorn, Astoria, Oregon.

—The patents are not ready for delivery by the Patent Office until some 14 days after the date of issue.  
NOTE.—Copies of U. S. and Foreign Patents furnished by DEWEY & CO., in the shortest time possible (by telegraph or otherwise) at the lowest rates. All patent business for Pacific coast inventors transacted with perfect security and in the shortest possible time.

WOODWARD'S GARDENS has the following new attractions. The buffalo chase; large whale skeleton; new museum; improvements in the zoological department, besides the other features which have made it popular.

## OUR AGENTS.

OUR FRIENDS can do much in aid of our paper and the cause of practical knowledge and science, by assisting Agents in their labors of canvassing, by lending their influence and encouraging favors. We intend to send none but worthy men.

J. L. THARP—San Francisco.  
B. W. CROWELL—California.  
A. C. KNOX—Pacific Coast.  
C. N. WEST—Santa Cruz, Monterey and San Benito counties.

A. C. CHAMPTION—Tulare, Fresno and Inyo counties.  
JOSEPH DUMICK—Mendocino, Humboldt and Del Norte counties, and Oregon.  
W. D. WURZ—San Bernardino and Los Angeles counties.

J. W. A. WRIGHT—Sacramento, Placer and San Joaquin counties.

B. E. LLOYD—Alameda, Contra Costa and Napa counties.

E. M. DENNY, Oregon.  
F. E. ALDERSON, Nevada.  
H. E. HALLER—San Joaquin, Yolo, Yuba, Sutter and Colusa counties.

## TO QUEBRISTS.

In propounding questions to the editorial, patent or business departments of this office, letter writers should be careful to enclose a stamp and addressed envelope if they wish prompt answer. If we were to furnish time, paper, envelopes and stamps, all free to parties who address this office on matters of more interest to themselves than to us, FIVE HUNDRED DOLLARS A YEAR would not cover the expense. This hint, however, is not intended for parties writing in our own or the public interest, or who would be obliged to delay writing at any time for want of an extra stamp.

## METALS.

[WHOLESALE.]

THURSDAY, M., December 27, 1877.

IRON.—  
American Pig, ton.....28 00 @ 32 00  
Scotch Pig, ton.....32 00 @ 33 00  
White Pig, ton.....28 00 @ —  
Oregon Pig, ton.....— @ —  
Rimmed Bar.....31 @ 64  
Horse Shoes, keg.....5 00 @ —  
Nail Rod.....— @ 71  
Norway, Oval.....— @ —  
Rolled.....— @ —

COPPER.—  
Copper Tinned.....37 @ 40  
Sheathing, lb.....37 @ 40  
Sheathing, Yellow.....22 @ 23  
Sheathing, Old Yellow.....10 @ 11  
Composition Nails.....21 @ —  
Composition Bolts.....24 @ —

STEEL.—  
English Cast, lb.....14 @ 5  
Anderson & Woods, ordinary sizes.....16 @ —  
Drill.....16 @ —  
Flat Bar.....15 @ 18  
Flaw Steel.....84 @ 124

TIN PLATES.—  
10x14 C Charcoal.....8 50 @ 9 00  
Banca Tin.....24 @ —  
Australian.....19 @ 20

ZINC.—  
By the Cask.....11 @ —  
Zinc Sheet 7x3 ft, 7 to 10, lb.....11 @ —  
7x3 ft, 11 to 14.....11 @ —  
8x4 ft, 8 to 10.....12 @ —  
8x4 ft, 11 to 10.....12 @ —

NAILS.—  
Assorted sizes.....3 00 @ 35  
QUICKSILVER.—  
By the lb.....47 1/2 @ 50

## LEATHER.

[WHOLESALE.]

WEDNESDAY M., December 26, 1877.

Sole Leather, heavy, lb.....25 @ 29  
Light.....22 @ 23  
Jodot, 8 Kil, doz.....48 00 @ 50 00  
11 to 13 Kil.....65 00 @ 70 00  
14 to 15 Kil.....80 00 @ 90 00  
Seated Choice, 16 Kil.....55 00 @ 60 00  
Cornelian, 12 to 15 Kil.....37 00 @ 40 00  
Females, 12 to 13 Kil.....63 00 @ 67 00  
14 to 16 Kil.....71 00 @ 75 00  
Simon Ulmo, Females, 12 to 13 Kil.....58 00 @ 62 00  
14 to 15 Kil.....59 00 @ 63 00  
16 to 17 Kil.....72 00 @ 74 00  
Simon, 18 Kil.....61 00 @ 63 00  
20 Kil.....65 00 @ 67 00  
24 Kil.....72 00 @ 74 00  
Robert Galt, 7 and 9 Kil.....35 00 @ 40 00  
Kips, French, lb.....1 00 @ 1 35  
Cal. doz.....40 00 @ 60 00  
French Sheep, all colors.....8 00 @ 15 00  
Eastern Calf for Sacks, lb.....1 00 @ 1 25  
Sheep Roams for Topping, all colors, doz.....9 00 @ 13 00  
For Linings.....5 50 @ 10 50  
Cal. Russet Sheep Linings.....1 75 @ 4 50  
Root Legs, French Cal, pair.....4 00 @ —  
Good French Cal, pair.....4 00 @ 4 75  
Best Jodot Cal, lb.....6 00 @ 5 25  
Leather Harness, lb.....35 @ 38  
Fair Bridle, doz.....48 00 @ 50 00  
Stirrup, lb.....33 00 @ 37 00  
Well, doz.....30 00 @ 32 00  
Buff, ft.....18 @ 20  
Wax Side.....17 @ 18

## GENERAL MERCHANDISE.

[WHOLESALE.]

WEDNESDAY M., December 26, 1877.

BAGS—Jobbing.  
Eng Standard Wheat, 9 @ 94  
Neville & Co's  
Hand Sewed, 22x36, 9 @ 94  
24x36.....— @ —  
23x40.....— @ —  
Machine Swd, 22x36, 9 @ 94  
Flour Sacks, halves.....84 @ 84  
Quarters.....84 @ 84  
Eighths.....4 @ 41  
Hessian, 60 inch.....15 @ —  
45 inch.....84 @ —  
40 inch.....— @ —  
Wool Sacks.....— @ —  
Hand Sewed, 34 lb, 42x36, 42 @ 42  
Machine Sewed.....42 @ 42  
4 lb.....41 @ 41  
Standard Gunies.....15 @ 6  
Bean Bags.....62 @ 8

CANDLES.  
Crystal Wax.....17 @ 17 1/2  
Eagle.....25 @ 30  
Patent Sperm.....25 @ 30  
CANNED GOODS.  
Assorted Pie Fruits.....— @ —  
2 lb cans.....2 75 @ 3 00  
Table do.....4 25 @ 4 25  
Jams and Jellies.....4 25 @ 4 25  
Pickles, 1 lb gal.....3 50 @ —  
Sardines, q box, 1 lb.....61 @ 90  
Hf Boxes.....3 00 @ —  
Preserved Beef.....— @ —  
2 lb doz.....4 00 @ —  
do Beef, 4 lb doz, 60 @ —  
Preserved Mutton.....— @ —  
2 lb doz.....4 00 @ —  
Beef Tongue.....6 50 @ —  
Preserved Ham.....— @ —  
2 lb doz.....6 50 @ —  
Deviled Ham, 1 lb.....— @ —  
do.....5 50 @ —  
do Ham 4 lb doz, 60 @ —  
COAL—Jobbing.  
Australian, ton, 7 75 @ 8 00  
Coke Bay.....6 50 @ 7 00  
Bellingham Bay, 6 50 @ —  
Seattle.....14 00 @ —  
Cumberland.....14 00 @ —  
Mt Diablo.....4 75 @ 6 76  
Lehigh.....22 00 @ —  
Liverpool.....7 00 @ 8  
West Harley.....7 50 @ 8  
Scotch.....7 00 @ 8 00  
Scranton.....13 00 @ 16 00  
Vancouver Id.....7 50 @ —  
Charcoal, sack.....75 @ —  
Coke, bbl.....60 @ —

PAINTS.  
Pure White Lead.....94 @ 104  
Whiting.....14 @ —  
Putty.....4 @ 5  
Chalk.....14 @ —  
Paris White.....24 @ —  
Venice Red.....34 @ —  
Preserved Red.....34 @ —  
Averill Mixed Paint, gal.....— @ —  
White Stints.....2 00 @ 32 40  
Green, Blue & Ch Yellow.....3 00 @ 35 50  
Light Red.....3 00 @ 35 50  
Metallic Roof.....30 @ 60

RICE.  
China No. 1, lb.....6 @ 6 1/2  
Hawailan.....5 @ 5 1/2  
SALT.  
Cal. Bay, ton.....10 00 @ 25 00  
Common.....10 00 @ 22 00  
Carmen Id.....15 00 @ 25 00  
Liverpool.....10 00 @ 25 00

SOAP.  
Castile, lb.....10 @ 10 1/2  
Common brands.....44 @ 6  
Fancy brands.....7 @ 8

SPICES.  
Cloves, lb.....45 @ 50  
Cassia.....224 @ 25  
Guatemala.....19 @ 19 1/2  
Nutmegs.....85 @ 90  
Pepper, Grain.....15 @ 17  
Pimento.....16 @ 18  
Mustard, Cal.....1 50 @ —  
lb glass.....1 50 @ —

SUGAR, ETC.  
Cal Cube, lb.....124 @ —  
Powdered.....13 @ —  
Fine crushed.....13 @ —  
Granulated.....124 @ —  
Golden O.....104 @ 104 1/2  
Hawailan.....10 @ 11  
C Sugar.....26 @ 30  
Hawailan Molasses.....26 @ 30

TEA.  
Young Hyson.....35 @ 50  
Moyune, etc.....30 @ 35  
Powder & Imperial.....50 @ 60  
Hyson.....30 @ 35  
Pouch Chow.....40 @ 50  
Japan, 1st quality.....25 @ 35  
2d quality.....25 @ 35

Gold, Legal Tenders, Exchange, Etc.  
[Corrected Weekly by SUTRO & CO.]  
SAN FRANCISCO, December 26, 3 P. M.  
LEGAL TENDERS IN S. F., 11 A. M., 97 1/2 @ 97 1/2. SILVER, 42 @ 50  
Gold in New York, 102 1/2  
GOLD BARS, 890 @ 910. SILVER BARS, 80 @ 85 per cent. discount.  
EXCHANGE on New York, 1 1/2; on London bankers, 49 1/2; Commercial, 50; Paris, five francs per dollar; Mexican dollars, 83.  
LONDON Consols, 94 11-16; Bonds, 105 1/2.  
QUICKSILVER in S. F., by the flask, 1 lb, 46 @ 47 1/2.

## Signal Service Meteorological Report.

Week Ending December 25, 1877.

HIGHEST AND LOWEST BAROMETER.  
Dec 19 Dec 20 Dec 21 Dec 22 Dec 23 Dec 24 Dec 25  
30.12 30.16 30.10 30.07 29.97 29.89 30.16  
30.04 30.10 30.04 29.85 29.75 29.76 29.87

MINIMUM AND MAXIMUM THERMOMETER.  
57 56 53 57 56 62 64  
54 43 62 51 49 46 47

MEAN DAILY HUMIDITY.  
76 87 80 71 66 72 75

PREVAILING WIND.  
N N W SE NW N SE  
WIND—MILES TRAVELED.  
167 111 110 140 105 297 120

STATE OF WEATHER.  
Clo'dy. | Clo'dy. | Rainy. | Fair. | Fair.  
RAINFALL IN TWENTY-FOUR HOURS.  
| .36 | | .49 | |  
Total rain during the season, from July 1, 1877, 4.54 in.

## TWENTY-FIFTH YEAR—1878.

## Hall's Journal of Health.

Contents of a Single Number:

The Little Courtesies of Life; Coughing in Consumption; Influence of Christianity on Medical Science; Ignorance and Ill Health; Rage and Ruin; Kindness the Best Punishment; Grass in Run; Valuable Table; Incurable Insanity; Consumption—A Suggestion; The Spirit Rapper Premium on Babies; Our Proverbs; Wrecked Clergymen; Marrying Well; The Lifting Cure; Sea Sickness; Face Painting; A Filthy Atmosphere; The Latest Crazy Man; A Suggestion; The Erie Railway; Sick Children.

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The above is the title of an illustrated work of 114 pages, for miners and prospectors, by Chas. H. Aaron, which has just been issued by Dewey & Co. Mr. Aaron has managed to give many useful hints and suggestions, free from all technicalities, and in such a style as to be easily comprehended. It is written for the miner, with no chemical symbols or metallurgical technicalities to confuse those who are not chemists or metallurgists. The following summary of the contents of the work will give an idea of its scope:

Under the heading of the first chapter, "Testing Ores for Silver," we find paragraphs on ore formation test for silver, with heat and water, acid or blow pipe. In speaking of testing for a process, the extent and richness of ore is considered, smelting ores, selecting and working same, appliances for testing, roasting, etc. Under the head of "Working Ores" the author describes Aaron's process, has something to say of superheated steam, preparation of dichloride of copper and protochloride of copper, use of copper and iron, quantity of chemicals, carbonate of lime, chloride ores, amalgam, Patschen's process, etc. He also describes the methods of working roasted ores, treatment of base metals, stirring, heat of furnace, want of sulphur, etc. Under the head of "Leaching Processes" are the titles, Smelting, Mexican process, Chilean process, Kroeck's process, etc. Under "Pulverizing Machines" are described the masta and its construction and operation, stamp batteries, screens, Crocker's trip-hammer hammer, Paul's pulverizing barrel, Kendall's battery, Noice's pulverizer, a cheap rock breaker, etc.

In speaking of amalgamators the author describes a cheap amalgamator, grinding the ore, directions for making a barrel, preventing mechanical wear, use of quicksilver, copper in bars, Freiberg barrel, cheap barrel trough, barrel on rollers, Aaron's amalgamator, separator, etc.

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An amendment to Section 336 of the California Code, taking effect July 1st, 1874, provides that in addition to the regular publication, daily or weekly, of the assessment and sale notices as heretofore,

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Must be served as provided in the following quotation from the law:

"The notice must be personally served upon each stockholder, or in lieu of personal service, must be sent through the mail, addressed to each stockholder at his place of residence, if known, and if not known, at the place where he principal office of the Corporation is situated."

The above refers to the ASSESSMENT NOTICE only. Advertisers in the MINING AND SCIENTIFIC PRESS will be furnished with copies of assessment notices printed on slips suitable for serving personal notice under this law at short notice.

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**Advance Silver Mining Company.**—Location of principal place of business, San Francisco, California. Location of works, Monitor District, Alpine County.

Notice is hereby given that at a meeting of the Board of Directors, held on the twenty-first day of November, A. D. 1877, an assessment of fifty (50) cents per share was levied upon the capital stock of the corporation, payable immediately in U. S. gold coin, to the Secretary, at the office of the company, Room 16, No. 309 California Street, San Francisco, Cal.

Any stock upon which this assessment shall remain unpaid on the second day of January, 1878, will be delinquent and advertised for sale at public auction, and unless payment is made before, will be sold on the twenty-sixth day of January, 1878, at 2 P. M., to pay the delinquent assessment, together with costs of advertising and expenses of sale.

Office, Room 16, No. 309 California St., San Francisco, Cal.

**California Fruit Growing Association.**—Principal place of business, San Francisco. Location of property, El Dorado County, Cal.

Notice is hereby given, that at a meeting of the Board of Directors, held on the seventeenth day of December, 1877, an assessment of two (\$2) dollars per share was levied upon the capital stock of the corporation, payable immediately in U. S. gold coin, to the Secretary, at the office of the company, Room 16, No. 309 California Street, San Francisco, Cal.

Any stock upon which this assessment shall remain unpaid on the twenty-second day of January, 1878, will be delinquent and advertised for sale at public auction, and unless payment is made before, will be sold on Saturday, the ninth day of February, 1878, to pay the delinquent assessment, together with costs of advertising and expenses of sale.

Office, 331 Sansome Street, San Francisco, Cal.

**Manzanita Gold Mining Company.**—Location of principal place of business, San Francisco, California. Location of works, Sulphur Creek, Colusa County, Cal.

Notice is hereby given that at a meeting of the Board of Directors, held on the third day of December, 1877, an assessment (No. 1) of ten (10) cents per share was levied upon the capital stock of the corporation, payable immediately in U. S. gold coin, to the Secretary, at the office of the company, No. 51 Fremont Street, San Francisco, Cal.

Any stock upon which this assessment shall remain unpaid on the eighth day of January, 1878, will be delinquent and advertised for sale at public auction, and unless payment is made before, will be sold on Thursday, the thirty-first day of January, 1878, to pay the delinquent assessment, together with costs of advertising and expenses of sale. By order of the Board of Directors.

Office, 51 Fremont Street, San Francisco, Cal.

**New Basel Consolidated Gravel Mining Co.**—Principal place of business, San Francisco, Cal. Location of works, Placer County, Cal.

Notice is hereby given that at a meeting of the Board of Directors, held on the tenth day of November, 1877, an assessment of seven and one-half (7 1/2) cents per share was levied upon the capital stock of the corporation, payable immediately in U. S. gold coin, to the Secretary, at the office of the company, 610 Merchant Street.

Any stock upon which this assessment shall remain unpaid on the twenty-eighth day of December, 1877, will be delinquent and advertised for sale at public auction, and unless payment is made before, will be sold on Monday, the fourth day of January, 1878, to pay the delinquent assessment, together with costs of advertising and expenses of sale.

Office, 610 Merchant Street, San Francisco, Cal.

**South Overman Consolidated Mining Company.**—Location of principal place of business, San Francisco, California. Location of works, Gold Hill, Nevada.

Notice is hereby given, that at a meeting of the Board of Directors, held on the twenty-sixth day of December, 1877, an assessment (No. 2) of twenty-five (25) cents per share was levied upon the capital stock of the corporation, payable immediately in U. S. gold coin, to the Secretary, at the office of the company, 323 Montgomery Street, Room 21, San Francisco, California.

Any stock upon which this assessment shall remain unpaid on the twenty-eighth day of January, 1878, will be delinquent and advertised for sale at public auction, and unless payment is made before, will be sold on Monday, the eighteenth day of February, 1878, to pay the delinquent assessment, together with costs of advertising and expenses of sale. By order of the Board of Directors.

Office, 323 Montgomery Street, Room 21, San Francisco, Cal.

**Summit Mining Company.**—Location of principal place of business, San Francisco, California. Location of works, Mineral Point Mining District, Plumas County, California.

Notice is hereby given, that at a meeting of the Board of Directors, held on the tenth day of December, 1877, an assessment (No. 1) of five (5) cents per share was levied upon the capital stock of the corporation, payable immediately in U. S. gold coin, to the Secretary, at the office of the company, 418 California Street, San Francisco, Cal.

Any stock upon which this assessment shall remain unpaid on the twenty-first day of January, 1878, will be delinquent and advertised for sale at public auction, and unless payment is made before, will be sold on Tuesday, the twenty-sixth day of February, A. D. 1878, to pay the delinquent assessment, together with costs of advertising and expenses of sale. By order of the Board of Directors.

Office, Room 2, No. 418 California Street, San Francisco, Cal.

**Timmy Chub Mining Company.**—Location of principal place of business, San Francisco, California. Location of works, Coronado Mining District, Los Angeles County, California.

Notice is hereby given that at a meeting of the Board of Directors, held on the fourth day of December, 1877, an assessment (No. 1) of fifty (50) cents per share was levied upon the capital stock of the corporation, payable immediately in U. S. gold coin, to the Secretary, at the office of the company, Room 25, Nevada Block, San Francisco, Cal.

Any stock upon which this assessment shall remain unpaid on the fourth day of January, 1878, will be delinquent and advertised for sale at public auction, and unless payment is made before, will be sold on Monday, the twenty-first day of January, 1878, to pay the delinquent assessment, together with costs of advertising and expenses of sale. By order of the Board of Directors.

Office, Room 25, Nevada Block, San Francisco, Cal.

**The Welch Consolidated Quicksilver Mining Co.**—Principal place of business, San Francisco, Cal. Location of works, Mount Diablo Mining District, Contra Costa County, Cal.

Notice is hereby given that at a meeting of the Board of Directors, held on the fifth day of December, 1877, an assessment (No. 1) of ten (10) cents per share was levied upon the capital stock of the corporation, payable immediately in U. S. gold coin, to the Secretary, at the office of the company, Room 7, No. 420 Montgomery Street.

Any stock upon which this assessment shall remain unpaid on the seventh day of January, 1878, will be delinquent and advertised for sale at public auction, and unless payment is made before, will be sold on Saturday, the twenty-sixth day of January, 1878, to pay the delinquent assessment, together with costs of advertising and expenses of sale.

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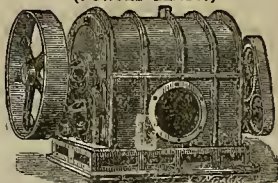
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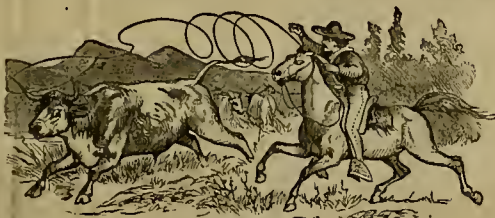
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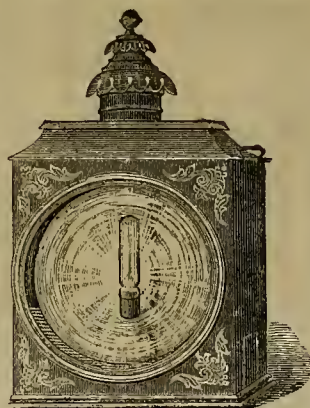
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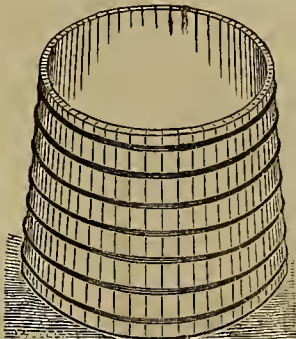
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